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LIVESTOCK FEED PROCUREMENT

ADVANTAGES OF CULTIVATING GOATSRUE FOR FEED IN ESTONIAN SSR

Moscow SEL'SKAYA ZHIZN' in Russian 30 Dec 81 p 2

/Article by Kh. Rayg, Doctor of Agricultural Sciences and head of a department at the Estonian Scientific Research Institute of Farming and Land Reclamation: "For the Green Production Line"/

/Text In Estonia, more extensive use is being made of an as yet little known forage crop -- eastern goatsrue -- for feeding to the livestock. Studies carried out at the Estonian Scientific Research Institute of Farming and Land Reclamation have shown that it possesses a number of valuable feed-biological, agrotechnical and economic properties.

Eastern goatsrue is a perennial crop. The duration of its cultivation is 7-15 years (an average of 10 years), which is five times more than that for clover and two times more than alfalfa. It is a stable and highly productive crop. On test fields, it furnishes up to 125 quintals of dry substance (10,000 feed units) per hectare and up to 20 quintals of crude protein per hectare, containing eight irreplaceable amino acids (lysine, methionine, isoleucine, tyrosine and others).

Goatsrue has a long growing period, thus making it possible to commence its economic use 2-3 weeks earlier than other grasses. In addition, it can withstand cold temperatures down to minus seven degrees and it can serve as an early or late element in the green production line. The feed value of goatsrue, depending upon the weather and soil conditions during the growing season, changes very little. The leaves and stalks retain their green coloring even after the seed has ripened. Nevertheless, the highest protein content in the plants is observed during the period from budding to the commencement of blossoming. Moreover, the leaves constitute the most valuable part of the plant; they contain 2.3 times more crude protein and 2.7 times more fat than do the stalks.

The content of mineral elements in goatsrue corresponds fully with the zootechnical requirements. The grass contains a large quantity of calcium, phosphorus and potassium and this is especially useful for ruminant animals. Thus, in terms of its feed properties, it surpasses clover, alfalfa, sweetclover and leguminous grasses. At the commencement of its blossoming, there is one feed unit per kilogram of dry substance and for each feed unit -- 158-216 grams of digestible protein. The digestibility of the nutrients in the feed is good.

In the spring the grass can be cut down 15-20 days earlier than clover or alfalfa. The greatest yield of dry substance, feed units and digestible protein is obtained

from two cuttings of a stand of goatsrue. The first mowing is carried out at the commencement of blossoming (initial days of July) and the second -- in early August. If good soil-climatic conditions prevail, a third mowing may be obtained towards the end of September. Our experiments have established the fact that this is the best period for the last mowing.

Goatsrue is capable of furnishing two yields on seed tracts -- seed and fodder, since the plants remain green and succulent after the seed has been harvested, with almost all of the leaves being retained. The fodder has high nutritional value and serves as an excellent raw material for ensilage or for the preparation of haylage.

The technology for preparing different types of grass feed from goatsrue is simple. However, owing to a high protein content and low amount of sugar, which is typical of pulse crops, the preparation of silage from goatsrue is made more difficult. On the other hand, preservatives (siloben and vakhera) make it possible to obtain high quality feed.

A protein concentrate can also be prepared from goatsrue fodder. Moreover its juice can be squeezed out very easily. It contains a comparatively high amount of dry substance and crude protein, considerably more than that contained in the juice of other pulse plants. Throughout the growing season it is possible to obtain no less than 1 ton of protein concentrate per hectare.

The best soils for goatsrue are sandy loam and damp light loamy types, but not waterlogged soil. Fine goatsrue yields are obtained from fen soil and flood plain lands. The reaction of the soil, similar to that for a majority of pulse crops, must be close to neutral. On poor and acid soils, goatsrue grows poorly, nodule bacteria do not develop on its roots and the plants die off usually during the first wintering period.

It must not be forgotten that this crop withdraws a large quantity of nutrients from the soil. Thus it will not produce the desired results if an adequate amount of fertilizer is not provided. However, similar to all pulse crops, goatsrue does not require a fertilizer that is in short supply -- nitrogen fertilizer.

The sowing methods are dependent upon the use to be made of the crop. In order to obtain fodder, it is sown with an inter-row spacing of 20-30 centimeters and a sowing norm (certified seed) of 30-40 kilograms per hectare. It bears mentioning that goatsrue responds less to the sowing norm -- it regulates the density of the grass stand itself by means of vegetative reproduction. Yet it imposes raised requirements with regard to light, especially following the seedlings, which appear comparatively rapidly. However, their growth slows down later and this can bring about the development of weeds. Thus inter-row cultivation and chemical weeding are mandatory. The most effective herbicide is aretiyt. It should also be borne in mind during the initial cultivation of this crop that the nodule bacteria required for growth and development of the plants are lacking in the soil. Thus, prior to sowing the seed, the bacterial fertilizer nitragin should be applied.

The highest yields of dry substance were obtained from pure sowings of goatsrue -- an average of 90 quintals per hectare over a period of 5 years. However, on fields which suffer from surface or ground water or have a different mechanical texture, goatsrue often perishes. Thus the cultivation of cereal grasses in a mixture with goatsrue raises the stability of a yield. For this purpose and in accordance with

the rhythm for development and growth during the formation period for the first cutting, the most suitable grasses are awnless brome grass, timothy and cock's foot. But the yield of dry substance from such a grass mixture decreases compared to pure sowings.

Compared to seed production for alfalfa and clover, the production of seed for goatsrue is more stable. The seed plants are planted with an inter-row spacing of 60-90 centimeters. The sowing norm is 7-10 kilograms per hectare. Solid sowings furnish seed during the first and second year of use. They ripen in August, do not shatter and are easily harvested by a combine. The seed yield is stable. Based upon its high biological potential and feed value, goatsrue warrants serious attention on the part of the specialists. It is already being used on many farms throughout the republic.

According to data obtained from studies carried out over a period of many years at EstNIIZM /Estonian Scientific Research Institute of Agriculture and Reclamation/, goatsrue as a forage crop is beyond comparison. Its importance is increasing owing to the fact that it raises the fertility of soil, enriching it with nitrogen. The economists also advocate the extensive use of eastern goatsrue. Actually, each feed unit of goatsrue hay is 37 percent cheaper than the hay of perennial grasses (clover + timothy) and a quintal of digestible protein -- 63 percent cheaper.

According to computations by scientific research institutes, in order to cover the deficit in feed protein in the Estonian SSR the sowing area for goatsrue must be increased to 10,000-12,000 hectares. It was not too long ago that such a task was beyond the capability of the farms -- they lacked the seed. Today such seed is available.

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LIVESTOCK FEED PROCUREMENT

COST ACCOUNTING INCENTIVES FOR INCREASING FEED PRODUCTION

Moscow PLANOVYE KHOZYAYSTVO in Russian No 12, Dec 81 pp 88-94

/Article/ by A. Yesin, senior scientific worker at the All-Union Scientific Research Institute of Agricultural Economics: "Cost Accounting Stimuli for the Development of Feed Production"/

/Text/ During the current five-year period, the average annual production of agricultural products will increase by 12-14 percent above the figure for the Tenth Five-Year Plan. More rapid rates of growth are called for in the production of animal husbandry products and especially meat. The average annual production of meat must be raised to 17-17.5 million tons (in dressed weight). The successful fulfillment of these plans will be dependent mainly upon the status of the feed base. "Everything that we wish to obtain from animal husbandry" stated L.I. Brezhnev during the July (1978) Plenum of the CC CPSU, "more meat, milk and other products -- everything is dependent in the final analysis upon sufficient feed being available, moreover it must be diverse and high quality feed".*

The overall nutritional value of the feed being consumed annually is in excess of 400 million tons of feed units. The insufficient production of feed and its low quality are restraining growth in the number of livestock and improvements in their productivity.

In the interest of overcoming this lag, the Basic Directions for the Economic and Social Development of the USSR During the 1981-1985 Period and for the Period Up To 1990 call for radical improvements in feed production and satisfaction of the feed requirements for public animal husbandry and also for the livestock and poultry being maintained on a private basis by citizens. To complete the preparation and commence the implementation of an all-round program aimed at creating a reliable and balanced feed base throughout the country for animal husbandry. To attach a specialized branch character to feed production being carried out at kolkhozes and sovkhozes. To focus special attention on ensuring that the farms can produce their own feed. To make greater use of food scraps"**. .

* L.I. Brezhnev. On Further Development of Agriculture in the USSR. Report delivered before the 3 July 1978 Plenum of the CC CPSU. Moscow, Politizdat, 1978, p 21.

** Materials of the 26th CPSU Congress. Moscow, Politizdat, 1981, p 164.

An increase in the production of feed, at rates which surpass the growth in the number of livestock (and it is only in the case of such proportions that the conditions required for raising the productivity of the animals are created), requires further work in connection with the cultivation of meadows and pastures, the introduction of more improved technology for the cultivation and harvesting of forage crops, an acceleration in the construction of feed storehouses and expansion and renovation of the pool of agricultural machines employed for feed production.

The intensification of feed production, a chief trend for solving the feed problem, requires considerable capital investments. A question arises in this regard in connection with their financial sources. The internal resources of kolkhozes and sovkhozes, as economic accountability enterprises, must serve as the principal sources. How is this problem being resolved: is feed production being developed as an independent branch by means of the internal savings of agricultural enterprises?

In accordance with the existing system, feed produced by field crop husbandry workers is taken into account in animal husbandry based upon its production cost. The financial resources required for expanding feed production are obtained not by the producers of the feed but rather by the animal husbandry workers. But such a distribution of responsibilities, with the responsibility for developing the feed base being entrusted to workers having no connection with feed production, is ineffective. The animal husbandrymen have direct obligations associated with the technological process for producing goods. They are responsible for the use and not for the production of feed. The profit they receive should be used for increasing the numbers of livestock and improving the qualitative structure of the principal herd, for the construction, modernization and mechanization of livestock facilities and feed preparation shops and for issuing material incentives to the workers.

In reality, the monetary earnings received from the sale of animal husbandry products in recent years have not always been sufficient for compensating for the production expenses of this branch. During the 1977-1980 period, animal husbandry operations were unprofitable at many agricultural enterprises throughout the country and the savings of individual kolkhozes and sovkhozes were not sufficient for covering the internal requirements of animal husbandry. Under such conditions, it was often more profitable for a farm to sell grain to the state that was intended for forage. Sales carried out at the procurement price, which at the present time is increased by 50 percent when the actual grain production level is exceeded, immediately provides the enterprise with a perceptible profit, whereas the use of grain for the production of animal husbandry products is less profitable and may produce profit only following the sale of these products.

In taking note of the shortcomings observed in the regulation of procurement prices (for some products, they did not compensate for the kolkhoz and sovkhoz expenditures), the July (1978) Plenum of the CC CPSU approved the decree of the CC CPSU and the USSR Council of Ministers concerning increases in the procurement prices for milk, potatoes, mutton and other products. Commencing in 1981, in conformity with the decree of the CC CPSU and the USSR Council of Ministers entitled "Improvements in Planning and in the Economic Stimulation of the Production and Procurements of Agricultural Products," the plans have called for improvements in the procurement prices for agricultural products and for the creation of conditions for strengthening economic accountability at the kolkhozes and sovkhozes.

At the present time, the monetary resources required for expanding feed production on the farms are provided for in the procurement prices for milk, meat and other types of animal husbandry products. Feed production cannot function as an independent branch under such conditions and, just as in the past, it will make use of savings formed from the sale of animal husbandry products. If the task is assigned of attaching a specialized branch character to feed production on each farm, then the solving of this task must not be limited to merely creating feed procurement brigades and detachments, particularly in view of the fact that all field crop husbandry subunits at any kolkhoz or sovkhos participate to varying degrees in the production of feed.

We are of the opinion that feed, similar to other products of labor, must be assigned a monetary evaluation which includes all of the components of value. A quintal of oats, barley or other forage crops must be taken into account in the expenditures for animal husbandry, in accordance with the same procurement prices used for selling these products to the state, regardless of whether they are consumed on the farm proper or shipped to other enterprises on the basis of inter-farm arrangements. Prices must be established for those types of feed which lack them at the present time: silage, haylage, food roots, green feed and others. Hence, we are advocating the development of feed production based upon internal branch savings.

The profit obtained by kolkhozes and sovkhos from the sale of animal husbandry products will be distributed in advance for further development of the feed base and for branch animal husbandry expenditures (see Table 1).

When the procurement price is kept at the same level, the use of a cost evaluation for the feed serves to raise the production per quintal of pork to 141 rubles and to reduce the profit from its sale from 36 to 15 rubles. The profitability, computed according to the ratio for 1 quintal of pork to the overall production cost, also decreases and amounts to 10.6 percent. But such a computation is correct when the feed is considered on the basis of its production cost. When the computation is carried out based upon prices which ensure an expansion in production by means of internal savings, the profitability must be determined by applying the profit only to the branch expenditures for animal husbandry. In this instance, its norm does not change, but rather it remains 30 percent just as in the past.

Since the amount of profit is the same in both instances and it becomes available to the farm only after the animal husbandry products have been sold, a question arises: will the problem be complicated by establishing prices for the feed and, on this basis, raising the production costs for the animal husbandry products? However, the computational methods exert different effects on the interest of the feed producers and consumers in reducing expenses, improving the quality of the products and increasing their production. The correct regulation of the relationships between the field crop husbandry and animal husbandry branches and their subunits (brigades, farms and so forth), increased interest in improving the quality of the feed, determining the efficiency of the field crop husbandry and animal husbandry branches, material incentives for the branch specialists and equalization of the economic conditions of those farms utilizing purchased and internally produced feed are all impossible in the absence of a monetary evaluation for the internally produced feed.

Table 1

Distribution of Profit for a Different Evaluation of Internally Produced Feed

Indicator	Evaluation of Internally Produced Feed at Agricultural Enterprises	
	According To Production Costs	According To Prices
1. Procurement price for 1 quintal of pork, rubles	156	156
2. Branch expenditures for swine breeding, rubles	50	50
3. Feed expenses, rubles	70	91
4. Production cost for 1 quintal of pork, rubles (line 2 + line 3)	120	141
Profit, rubles:		
5. A monetary evaluation of internally produced feed (line 3 group 4 - line 3 group 3)	-	21
6. From the sale of pork (line 1 - line 4)	36	15
7. Total	36	36
Profitability, %		
8. Overall (line 7: line 3 group 3 · 100)	30	10.6
9. Feed production (line 5 group 4: line 3 group 3 · 100)	-	30
10. Swine breeding (line 6 group 4: line 2 · 100)	-	30

Under the existing system, a feed computation based upon production cost excludes the possibility of an objective evaluation of the work performed by the feed producers and animal husbandrymen. Whereas the field crop growers achieved a low production cost for grain, the workers on swine farms obtained profit and yet with an increase in expenditures for the production of grain and the work of the swine farms becomes unprofitable, although in both instances the results are conditioned by factors which are not dependent upon the work of the swine breeders. The establishment of sound prices for internally produced feed makes it possible to determine the effectiveness of feed production and it enables workers in each branch to accept responsibility for the results of their work.

The actual production cost, according to which feed is credited at a farm and written off as animal husbandry expenditures, precludes the possibility of considering the quality of the feed. Thus the existing system is one of the causes of the reduction in the nutritional value of the feed and, it follows, of a considerable over-expenditure of feed compared to the zootechnical norms. This applies in particular to cattle husbandry, where the feed expenditures are great and continue to increase.

Since one of the principal indicators for evaluating the work of subunits and determining the dimensions of material incentives is the value of the gross output, we believe that the most efficient stimulus for improving the quality of feed must be the prices established for each type of feed, with the type corresponding to a definite quality standard. In the case of higher prices for feed of improved quality, an increase will take place in the value of the gross output and in the amount of incentive payments issued to the producers of the feed. Even in bookkeeping documents, the feed should be considered in terms of the

prices, in the expenditures for animal husbandry. This will make it possible to arrange the economic accountability relationships within an enterprise in the correct manner and to eliminate the disparity in evaluating the work of farms, wherein one of them, in accordance with the existing method for computing feed according to production cost, obtains hay having a content of 54 feed units in one quintal and another -- 35 feed units.

The use of hay of varying qualities produces different results. However, in view of the fact that its quality is not considered in the production cost for the hay, the existing method for computing feed inevitably leads to a distortion in the work indicators for animal husbandry subunits.

In conformity with the above-mentioned decree of the CC CPSU and the USSR Council of Ministers, bonuses can be issued to farm specialists based upon the operational results of the pertinent branches or production sectors. The results are determined by the indicators for profit and the increase in profit, compared to the actual average annual level. A determination of these indicators becomes possible only in the presence of a monetary evaluation of the feed. At the present time, with profit being determined according to the volume of products sold and feed being considered in terms of production costs, it is actually becoming impossible to issue bonuses for obtaining profit or an increase in profit.

The production of animal husbandry products may increase, but if in the process an increase also takes place in the proportion of products used for feed, then the effectiveness of the branch will decrease in the face of stable production costs. And conversely, the amount of profit may increase in the face of stable production volumes, but only by means of a reduction in the proportion of the products used for feed. Under such conditions, bonuses can be awarded only on the basis of overall farm results, but in the process the link existing between the material stimuli and the operational results of the branch in which a particular specialist works is lost completely.

A similar situation is created when determining the indicators for labor productivity and the effectiveness of use of fixed production capital. Towards this end the value of the gross output in comparable prices is computed for one average annual worker and for 1,000 rubles of fixed production agricultural capital. However, the comparable prices do not reflect the changes in the quality of the products produced. Gross output production may increase, with like increases taking place in labor productivity and output-capital ratio. However, neither the state nor the enterprise will obtain real profit if this increase occurred as a result of a deterioration in the quality of the output.

In order to determine the branch effectiveness of use of live and materialized labor and the period for the repayment of fixed capital, the gross output must be evaluated in terms of the existing procurement prices, taking into account the quality of the output and the production schedules. But such an approach is hampered by a computation of internally produced feed based upon the production cost, since the higher the proportion of feed in the gross output of field crop husbandry, the less profit is obtained, the lower the effectiveness of live labor and the use of fixed capital and the longer the period established for the repayment of the fixed capital. The best arrangement is enjoyed by those farms where the volume of marketable output reaches a maximum amount.

As a result of growth in specialization, the creation of inter-farm enterprises and greater capabilities for the mixed feed industry, feed sales have increased. In 1979, the proportion of purchased feed, compared to the overall volume of purchased feed expended for the development of public animal husbandry at kolkhozes, amounted to 21.2 percent in terms of value; at sovkhoses -- 42.2 percent. A number of enterprises have appeared within the system of state complexes for the production of animal husbandry products on an industrial basis, especially in poultry and swine production, which utilize purchased feed completely or almost completely.

In addition to acquiring feed, the kolkhozes and sovkhoses in turn supply forage grain and other feed to inter-farm mixed feed plants and enterprises for the production of animal husbandry products and they also sell such feed to kolkhoz members and sovkhos manual and office workers. The selling of feed to kolkhoz members and sovkhos workers is not limited at the present time to grain, straw and hay, but rather it includes haylage, silage, food roots and other types of feed. Further growth in the sale of feed to the population can be expected during the next few years in connection with the development of the private plots. Such sales will be carried out using the feed resources of agricultural enterprises and also through state and cooperative trade.

Under the existing methods for price formation, those farms which employ internally produced feed operate under worse conditions. There is no need for enterprises which purchase feed to allocate resources for expanding the production of feed. Thus they are free to utilize completely the profit that is obtained for developing animal husbandry and also for awarding material incentives to workers engaged in animal husbandry.

Profit is distributed in a different way on farms which use internally produced feed. Since the feed is taken into account in the expenditures for animal husbandry, in accordance with the production cost, the profit realized from the sale of products must be employed for development and for awarding incentives to workers in both branches -- feed production and animal husbandry. Table 2 reveals how the profit is distributed in accordance with the existing methods for forming the procurement prices for animal husbandry products.

The operational results of two specialized swine raising enterprises (standard) are compared in Table 2. Both possess the same production capability, but one utilizes internally produced feed and the other -- purchased feed. The planned supply of the latter enterprise with purchased feed, balanced in terms of its nutritional value, made it possible to reduce feed expenditures by 33 percent compared to the other enterprise. This circumstance, in addition to reducing branch expenditures owing to the use of an industrial technology, even in the face of a comparatively high cost for the purchased feed, made it possible to obtain products having the same production cost as those at enterprises which use internally produced and cheaper feed. It is noted that specialized swine raising and poultry raising farms which purchase feed quite often have the same (or lower) production cost, compared to farms which produce the same products based upon internally produced feed.

In order to create equal economic conditions, the internally produced feed must be taken into account in the animal husbandry expenditures, in accordance with the established prices. In this instance, the profitability norm in procurement prices for animal husbandry products must be computed taking into account only the branch expenditures for animal husbandry.

Table 2

**Data on Approximate Computation of Financial Results of Sale of Swine Raising
Products for Different Feed Sources**

Indicator	Enterprises Which Use Feed			
	Internally Produced Feed (with production cost taken into account)		Purchased Feed (with prices taken into account)	
	Per Quintal of Product	For Entire Output Volume, (in thous. of units)	Per Quintal of Product	For Entire Output Volume, (in thous. of units)
1. Amount of products sold, quintals	-	30	-	30
2. Feed expenditures, quintals of feed units	9	270	6	180
3. Cost of 1 quintal of feed units, rubles	8	-	14	-
4. Feed expenditures, rubles	72	2160	84	2520
5. Branch expenditures for animal husbandry, rubles	58	1740	46	1380
6. Including wages	24	720	12	360
7. Output production costs, rubles (line 4 + line 5)	130	3900	130	3900
8. Monetary earnings, rubles	169	5070	169	5070
9. Profit, rubles (line 8 - line 7)	39	1170	39	1170
10. Profitability, % (line 9:100: line 7)	30	30	30	30
11. Profit (in rubles), used for development: feed production with an evaluation of feed according to production cost (line 10: line 4:100)	-	648	-	-
animal husbandry (line 9 - line 11)	-	522	-	1170
12. Branch profitability of animal husbandry, % (line 12: line 5:100)	-	30	-	67.2
13. Profit per ruble of wages, rubles (line 12 : line 6)	-	0.73	-	3.25

In our example, the procurement prices for pork and the financial results would have been as shown in Table 3.

The establishment of prices for internally produced feed will promote improvements in the quality of the feed and a reduction in feed expenditures per unit of product. Thus, in Table 3, the expenditure norm per quintal of weight increase dropped from 9 to 8 quintals of feed units. On the whole, the feed expenditures considered in the cost for the entire output production volume will be roughly the same at both enterprises, but the use of an industrial technology at one of these enterprises will bring about differences in the indicator for branch expenditures.

Since in both variants the feed is computed according to prices which ensure the development of feed production by means of internal savings, the norm for profitability in procurement prices is established only for the branch expenditures

of animal husbandry, that is, minus the cost for the use of the feed. In this instance, both enterprises will enjoy identical conditions for developing production and forming the economic incentive funds.

Table 3

Data on Approximate Computation of Procurement Prices for Swine Raising Products for an Evaluation of Internally produced Feed According To Established Prices

Indicator	Enterprises Which Use Feed			
	Internally Produced Feed		Purchased Feed	
	Per Quintal of Product	For Entire Output Volume (in thous. of units)	Per Quintal of Product	For Entire Output Volume (in thous. of units)
1. Quantity of products sold, quintals	-	30	-	30
2. Feed expenditures, quintals of feed units	8	240	6	180
3. Cost for 1 quintal of feed units, rubles	10.4	-	14.0	-
4. Feed expenditures, rubles	83.2	2496	84.0	2520
5. Branch expenditures for animal husbandry, rubles	58	1740	46	1380
6. Including wages	24	720	12	360
7. Production cost (line 4 + line 5), rubles	141.2	4236	130	3900
8. Profit computed for a profitability of 30 percent, taking into account the branch expenditures for animal husbandry (line 5:30 : 100), rubles	17.4	522	13.8	414
9. Monetary earnings (line 7 + line 8), rubles	158.6	4758	143.8	4314
10. Profitability with regard to production cost (line 8: line 7:100), %	-	12.3	-	10.6
11. Profit per ruble of wages (line 8: line 6), rubles	-	0.73	-	1.15

A monetary evaluation of internally produced feed, including the norms for savings, which eliminates the economic inequality of enterprises which use internally produced and purchased feed, can also be employed for feed deliveries to inter-farm enterprises and for sales to kolkhoz members and sovkhos workers. The introduction of permanent prices for feed will promote stabilization in the production costs for animal husbandry products and in the income obtained from the sale of such feed. Possible deviations may take place in these indicators not so much because of increased or lowered prices for the feed, but rather owing to the quality of the work performed by the animal husbandrymen.

The creation of conditions for the development of feed production, based upon economic accountability (such that the producers of the feed would themselves be

responsible for the operational results of the branch and for the creation of the sources required for its intensification), will promote improvements in the economic accountability relationships at all levels of production control.

The attaching of a branch character to feed production and its conversion over to economic accountability principles for development will provide feed production with the same economic conditions encountered by workers in other branches, where the chief economic accountability levers are the procurement prices and quality standards established by the state.

At the present time, the quality of the different types of feed under interfarm cooperation is determined on the basis of many properties. Thus the quality of hay is dependent upon the ratio between cereal and leguminous plants and the content of moisture, protein, carotene and cellulose. The grade of the hay is established based upon the totality of these and other properties. The grades for silage and haylage are determined based upon the total number of points assigned for various indicators (acidity, carotene content, protein, smell, color and so forth). The quality of green feed is evaluated according to the developmental phases of the forage plants and it is expressed in coefficients.

A substantial shortcoming in such a classification, in addition to the complexities involved in determining feed quality, is the fact that when deciding upon a particular grade no consideration is given to the nutritional value, upon which the effectiveness of feed usage is dependent in the final analysis. A feed unit has been used for many years in our country as a standard for nutritional value. It serves to describe the normative and actual feed expenditures per unit of animal husbandry output, the overall feed production volume and the feed structure.

Since the content of digestible protein is not reflected in a feed unit, a ration which is unbalanced in terms of protein content often leads to an over-expenditure of feed units per unit of animal husbandry output. In order to achieve a more efficient interrelationship between feed consumption and yields of milk, meat and other products, attempts are being made to use feed protein units instead of feed units. For example, in the Moldavian SSR, when transferring feed over to the process of interfarm cooperation, the price for the feed is determined taking into account the content of feed protein units. But the method for determining the number of feed protein units has still not been finalized. In some instances, it is established taking into account the content of digestible protein in oats; in other instances, an arbitrary grain unit is used as the base, with digestible protein constituting 10 percent of the bulk.

Based upon the use of feed units, it would seem to be advisable to compute the feed protein units based upon the protein content in oats, particularly in view of the fact that zonal procurement prices are available for this crop. Such a decision does not exclude the use of a scientific approach for finding a more improved general-purpose unit for the nutritional value of feed. In this regard, interest is being displayed in the operational experience of production cooperatives in the German Democratic Republic. Here, over a period of many years, feed has been taken into account in animal husbandry expenditures in accordance with prices and all of the quality characteristics of the feed have been reduced to an energy unit which appears as a standard for its nutritional value.

In addition to the development of prices and standards for the feed and improvements in the prices for animal husbandry products, the conversion of feed production over to economic accountability requires the implementation of a number of other measures. Among them, great importance is attached to strengthening the logistical base for feed production. Here we have in mind not only deliveries of machines for the production of feed and the carrying out of soil improvement work on natural meadows and pastures, but also the construction of storehouses for hay, silage, haylage and root crops which will ensure more completely the preservation of the feed, with no deterioration in quality, and also the mechanization of all operations concerned with the delivery to and removal of feed from these storehouses. It is known that the most widespread method of storing hay in stacks and moving it to the consumption areas during the winter results in tremendous losses of hay and a considerable reduction in its quality.

An important condition for increasing feed production is that of creating economic accountability subunits at each agricultural enterprise. These subunits will be capable of performing the following functions using their own resources: carrying out the principal operations concerned with the cultivation of forage crops, raising the productivity of the meadows and pastures and procuring and transporting feed. At an overwhelming majority of the kolkhozes and sovkhoses, the most reliable and justified form for organizing labor is that of the tractor-field crop brigade, with such brigades being assigned sowing areas, meadows and pastures. The availability to such brigades of the required amounts of equipment and manpower is making it possible to carry out all of the principal operations, to make proper use of the land and other resources and to coordinate material incentives with production results.

In addition to permanent tractor-field crop brigades, mobile detachments and teams should ideally be created for the procurement and shipment, using the flow line method, of green feed, hay, haylage and silage, and also for work concerned with improving meadows and pastures. The kolkhozes and sovkhoses must carry out measures aimed at raising the productivity of natural feed lands on those tracts of pasture land which are set aside for the grazing of livestock or for procuring hay for the owners of private livestock.

We are of the opinion that a monetary evaluation of feed, one which takes into account the quality of the feed, will motivate the animal husbandrymen into utilizing the feed in a more rational manner. For the purpose of achieving this goal, great importance is being attached to ensuring that the agricultural organs observe the optimum ratios between feed consumption and feed production. Only if this condition is met will feed consumption per unit of animal husbandry product be held to a minimum and production costs -- kept at the lowest level. Over the past few years, the kolkhozes in Estonia have set a fine example in this regard. Feed consumption here per quintal of weight increase in swine (taking into account maintenance of the principal herd) has been 5.5-5.7 quintals of feed units and the average daily weight increase -- more than 500 grams. In order to achieve the optimum proportions between feed consumption and feed production, the forage funds must be formed in conformity with the plan adopted for their creation.

The assignment of economic accountability principles of development to feed production touches upon many aspects of the economics of enterprises, their

interrelationships with the state and joint collaboration in various interfarm formations. These problems can be solved most successfully on the basis of experimental checks being carried out in individual rayons and oblasts in various natural-economic zones of the country.

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LIVESTOCK FEED PROCUREMENT

VALUE OF WINTER RYE HYBRIDS FOR FEED IN STAVROPOL'SKIY KRAY

Moscow SEL'SKAYA ZHIZN' in Russian 18 Dec 81 p 2

[Article by A. Kitayev, deputy director of the Stavropol' Scientific Research Institute of Agriculture, V. Shvydkiy, candidate of agricultural sciences, and O. Petrov, senior scientific worker at the institute: "For the Green Conveyor"]

[Text] The green mass of winter rye in pure form or in a mixture with winter rape, as well as of winter wheat, of perennial and annual cereal and leguminous grasses and of their mixtures, is now widely used on farms in Stavropol'skiy Kray for the feeding of animals during the spring and summer period.

Winter rye and its mixture with rape produce the earliest succulent feed, but the period of their utilization for these purposes is not long. In our kray it begins during the third 10-day period of April and ends at the beginning of May. The sowing of winter wheat in pure form or in a mixture with winter vetch produces green fodder from 5 through 20 May. Perennial grasses make it possible to provide farms with fodder from the third 10-day period in May until the middle of June. On many farms, where the areas sown with perennial grasses are still negligible, an extremely undesirable "window" in the provision of animals with green fodder is formed. By sowing a new grain crop--Triticale--it is possible to "close" it and to prolong the period of use of green fodder by 10 to 12 days as compared with winter wheat.

The Stavropol'skiy-1 variety of fodder Triticale of the selection of the Stavropol' Scientific Research Institute of Agriculture has become most widespread on areas sown for green fodder in the kray. It was regionalized in Stavropol'skiy Kray and Rostovskaya Oblast for cultivation in both pure form and instead of winter wheat in a mixture with winter vetch. This variety, ensuring the highest output of feed per hectare, for example, produces 17 to 21 quintals of dry substance more than winter rye varieties. All winter wheat varieties are also inferior to it. On the Kolkhoz imeni Kirov in Aleksandrovskiy Rayon, on the Put' Lenina Kolkhoz in Kurseskiy Rayon, on the Yegorlyk'skiy Sovkhoz in Isobil'nenskiy Rayon and on the Mikhaylovskoye Experimental Farm in Shpakovskiy Rayon the average harvest of the green mass of Triticale totals 290 to 350 quintals per hectare.

However, it is not only a question of the mass, but of its fodder value. According to the data of the Kray Agrochemical Station, in the content of digestible protein Triticale is second only to sainfoin and lucerne and contains a great deal of calcium and phosphorus. Milch cows, which received Triticale, gave 13 percent

more milk than animals which were fed the green mass of winter wheat. The content of fat in the milk of the experimental group was also higher. When the green mass of Triticale was fed to feeder bulls on our institute's Mikhaylovskoye Experimental Production Farm, their average daily weight gains were much higher, while the expenditures of fodder on output were reduced 15 percent.

The largest harvest of the fodder mass of Triticale is obtained when it is sown during the third 10-day period in August or in the first 10-day period in September. However, for the green conveyer it is also possible to sow this variety during the third 10-day period in September and thereby to prolong the feeding period.

The best rate of sowing fodder Triticale for seeds is 60 to 70 kg per hectare and for green fodder, 110 to 120. The depth of seed placement is 5 to 6 cm. Predecessors, the soil cultivation system, doses of fertilizer application and care of crops are almost the same in both cases. The highest fodder harvest is obtained when Triticale is harvested during the period from the appearance of the last leaf until the beginning of ear formation. However, under favorable conditions high output is also obtained at the phase of plant shooting. At that time the plants contain mostly digestible protein, as well as fat, carotene and other nutrients.

Good results are obtained on farms when Triticale is sown in a mixture with winter and spring vetch. Winter vetch blossoms when Triticale forms ears, which coincides with the greatest accumulation of their plant mass. The output of dry substance from such mixed sowings is much higher than from pure sowings and 36 percent higher than when wheat is cultivated with vetch. During favorable years the harvest of green mass of the mixtures of Triticale with winter vetch reaches 550 to 600 quintals and the output of protein, 1 to 1.2 tons per hectare.

Perennial Derzhavinskaya-29 rye receives ever greater recognition on farms in North Caucasus. This is a typical fodder variety--thin-stemmed and very leafy. It successfully combines a relative longevity, a high yield, accelerated development and growth as compared with perennial grasses, good winter-hardiness and resistance against fungus diseases and a strong root system ensuring a high drought resistance. All this makes it possible to grow fodder rye both on sandy loam and heavy soil, including weakly salinized soil, which is very important for many southern steppe regions.

Its soil protective properties are of great value. When sown on schedule, 1½ to 2 months after the appearance of shoots it completely arrests water and wind erosion. This capability of perennial rye was utilized on the Mikhaylovskoye Experimental Production Farm for soil stabilization on the most erosion-dangerous plots.

The harvests of green mass of Derzhavinskaya-29 reach 512 quintals per hectare during the first year of life and 922 quintals in 3 years of use. In its nutritiousness perennial rye greatly surpasses ordinary winter varieties and contains about 13 percent of protein in its dry substance.

In production perennial rye is used mostly as a pasture crop. Good experience in this respect was accumulated on the Bol'shevistskaya Iskra Sovkhoz in Budennovskiy Rayon located in the kray's arid zone. This farm annually uses such sown areas mainly for grazing young sheep. Perennial rye is considered an insurance crop, because it produces a good yield even during acutely dry years, as well as during the first weeks of spring, when there is not yet grass suitable for grazing on other pastures.

The period of intensive pasture use of perennial rye in this zone is 2 years. The sovkhos provides itself with its own seeds and partially sells them to other farms. As the experience of the Tallyk Sovkhoz in Prikubanskiy Rayon, Karachayevo-Cherkesskaya Autonomous Oblast, has shown, in a sufficient moisture zone areas sown with perennial rye can be used no less than 4 years.

In Krasnodarskiy Kray the experience in the cultivation of Derzhavinskaya-29 rye on weak solonets low-humus chernozem on the Put' Il'icha Kolkhoz in Uspenskiy Rayon deserves attention. It is sown for a fundamental improvement in unproductive natural pastures and on slopes in the zone of intensive wind erosion.

The demand for Derzhavinskaya rye seeds has now increased sharply. Therefore, the production of elite seeds of this variety was organized at the Stavropol' Scientific Research Institute of Agriculture. However, the Mikhaylovskoye Experimental Production Farm is not yet able to meet all the requests and small batches of seeds are allocated to farms only for reproduction plots.

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LIVESTOCK FEED PROCUREMENT

IMPROVING QUALITY, EFFECTIVE UTILIZATION OF LIVESTOCK FEED

Moscow SEL'SKOYE KHOZYAYSTVO RISII in Russian No 11, Nov 81 pp 29-33

[Article by V. Shcheglov, professor: "The Quality and Efficiency Factor of Forage"]

[Text] Under the Eleventh Five-Year Plan it is intended to complete the development and begin the implementation of a comprehensive program for creating a reliable and balanced feed base for animal husbandry in the country. This means that it is necessary to achieve not only a steady increase in the gross production of feeds throughout the years, but also, which is no less important, high quality of these feeds.

Unfortunately, we are still not succeeding in carrying out this task. The significant drop in feed production and the still largely poor quality of feeds lead to underproduction of animal husbandry products, and they are reflected in the physiological condition of the animals, the reproduction of the herd and the development of young animals. It is known, for example, that one year with a shortage of feed has a negative effect on a number of generations.

On a number of farms feed production is increasing, but the productivity of the livestock remains essentially unchanged. And this is because of the poor quality of the feeds. But it too is improving, although approximately one-third of the feeds that are procured are of a poor grade. Hence the overexpenditure of feeds in the production of meat, milk and other animal husbandry products.

It has been established that the nutritive content of hay, silage and haylage of the third class is 24-30 percent less than that of similar feed of the first class, and that of unclassified feed is 1.5-2 times less. This year the farms of the Russian Federation prepared a significant quantity of hay and haylage, and increased the production of silage (especially corn silage). It is important not to allow losses of forage during storage. Here are the results of scientific observations of the possible losses of feeds with unfavorable storage conditions: from leaking (underflooding) of deep trenches--10-50 percent; wet stacks and ricks--15-70 percent; molding--20-80 percent; and overwarming and self-warming of the mass--30-100 percent.

Bulk (coarse and juicy) feeds constitute the basis of the winter rations of the livestock. Therefore it is necessary to take measures not only to preserve it, but also to increase its nutritive content.

The procurement of a sufficient quantity of feeds, even of a high quality, is a decisive condition, but it still does not guarantee the maximum productivity of the animals. That is, the efficiency factor (KPD) of feeds can be low.

How does one raise it?

One of the conditions that determine the level of the KPD of the feeds is their utilization in rations that are balanced in terms of all the basic elements of nutrition.

Observing the principle of balanced rations makes it possible to increase the return from the feeds by 15-50 percent. This is confirmed by our research with three groups of lactating cows. When they were fed a hay-silage concentrated ration containing 10 feed units and 1,100 grams of digestible protein, the daily milk yield changed significantly, depending on how the feed was balanced in macro- and micro-elements and easily hydrologized carbohydrates.

Balancing the ration in terms of mineral substances provided for an increase in the KPD of 25 percent, and in mineral substances and carbohydrates (by adding a small quantity of molasses)--by 50 percent. The productivity of the cows increased correspondingly. We also established the effectiveness of balancing rations in terms of nutritional elements which were in short supply in an experiment with summer feeding of livestock. The experiment was conducted on the Yermolino experimental production farm in Dmitrovskiy Rayon in Moscow Oblast on cows of the black-mottled breed which were divided into four groups of 22 head each.

The first group of animals (control) received the farm ration, including 300 grams of concentrated feeds per liter of milk; the second group received the same ration plus 60 grams of mineral supplement which provides for balancing the mixture in terms of calcium and phosphorus. The animals of the third group were fed the same as the second, but, in order to balance the ration in terms of cellulose and dry substance, chopped grass was added. The fourth group of cows received the same feed as the third plus a kilogram of molasses per head each day in order to balance the ration in terms of easily hydrolized carbohydrates.

The experiment lasted throughout the entire pasture period--from 20 May through 15 September. The results are presented in Table 1.

From the table one can see that balancing the ration in terms of macro- and micro-elements, cellulose, dry substance and sugar-protein through comprehensive supplements of elements that were insufficient in the pasture grass made it possible to increase the digestibility of the feeds (by 3.6 percent), the utilization of nitrogen (by 15.5 percent), the fat content of the milk (by 0.13 percent) and the productivity of the cows (by 27.8 percent). Moreover, the expenditures of feed units per liter of milk decreased by 13 percent. The net profit from the sale of the additional milk increased and, minus the cost of the supplements, amounted to 165 rubles from each cow.

An important factor in raising the KPD of the feeds is to reduce the proportion of nutritive substances necessary for supporting the life of the animal and to increase the proportion that goes for productivity. It is known that a significant proportion of the consumed feed is expended for supporting life, and only after this requirement is satisfied does the remaining part go for the formation of products. Thus the higher the proportion of productive feed, the less the expenditures per unit of output. It was established in experiments, for example, that giving lactating cows 2.5, 5.0 and 7.5 feed units in excess of the amount required to sustain life (5 feed units) provided for obtaining 5, 10 and 15 kilograms of milk, respectively, and expenditures per kilogram of it amounted to 1.5, 1.0 and 0.83 feed units. That is, the KPD of the feed was, in the second instance 1.5 times, and in the third instance 1.7 times as great as in the first instance.

The practical significance of this pattern consists in that under concrete production conditions the most economical expenditure of feeds is achieved when the requirements of the animal are satisfied up to the level of the potential capability of producing products. In places where this principle is observed the productivity of the animals is high with a minimum of expenditure of feeds per quintal of output.

The structure of the ration and the system of feeding are of essential significance. During the winter period, taking into account the diversity of zonal peculiarities of feed production, it cannot be the same everywhere. A reasonable selection of feeds in the ration should pursue two goals: on the one hand, maximum utilization of feeds that are difficult to eat in pure form, and on the other, provision of an optimal ratio of nutritive substances that are necessary for satisfying the needs of the animals in order to achieve the planned productivity.

The transformation of nutritive substances of feeds into nutritive substances of milk, meat and other animal husbandry products takes place most efficiently if they enter the organism simultaneously and in an optimal ratio. If there is an inadequate amount of one of the elements the level of utilization of all the other nutritive substances decreases correspondingly. Consequently the feed must be given to the animal in the necessary ratio and in the form of a mixture that is balanced in terms of all of the elements of nutrition.

None of the feeds that are fed to the animal can provide for the necessary ratio of nutritive substances by itself. The feeds augment one another in terms of elements that are in short supply when they are mixed together, and their digestibility and utilization also increases, which makes it possible to increase the effectiveness of each by 15-20 percent.

Taking advantage of the "augmenting effect" of the feeds, with an optimal combination of them in the ration, it becomes possible to achieve more economical expenditure of feeds that are costly and in short supply, especially concentrated feeds, artificially dried green feeds, and feeds of animal origin.

Preparing feeds for feeding makes it possible to increase the KPD of the forage. Practically all of them must be treated to one degree or another before they are distributed to the animals. A whole number of devices are recommended for increasing their edibility--crushing, steaming, seasoning, adding yeast and others. But the preparation for feeding must also include the nutritive content of the

feeds. To this end we have begun to use widely such methods as enriching them with nutritive elements that are in short supply, mixing them and treating them with chemical and biological preparations. Depending on the type and method of preparation of the feed, its nutritive content can be raised 1.5-2.5-fold. An especially appreciable effect is achieved when the feeds are given to the animals with a high content of cellulose, primarily straw.

In terms of its gross energy content, straw is just as good as concentrated feeds. But, because of the high cellulose content and the poor digestibility, only a little more than one-fourth of this energy is accessible to the animals' organism. This is explained by the fact that the plant cells which contain the energy of the organic substances of the straw are saturated with practically undigestible substances--lignin, cutin and various mineral compounds.

The most varied methods are used in practice for preparing straw for feeding--crushing, soaking, flavoring, mixing, steaming, self-warming and others. But they increase mainly its edibility, and not its nutritive content.

The digestibility and the nutritive content of the straw are increased by treating it with various alkalis--caustic soda, lime, soda ash, liquid ammonia and ammonia water, which are applied both individually and in combination with other reagents and physical devices (thermochemical, barothermal).

Both a "wet" and a "dry" method are suggested for treating straw with alkalis. The first consists in treating it with a 3-5 percent solution of caustic soda, using 3-5 kilograms of it dissolved in 80-100 liters of water per quintal of mass. After the solution has drained off and the straw has been kept for 10-24 hours, it is fed to the animals without being soaked in water. This kind of feed cannot be stored.

Alkali treatment of straw by the "dry" method is done with special machines like the Danish Taarup-805. The straw is crushed and put into a special mixer where it is treated with a concentrated 27-33-percent solution of caustic soda. This way the alkali permeates all particles of the mass. Each ton of dry straw requires 40-50 kilograms of crystalline NaOH. With this method the moisture content does not increase significantly: from 17-18 to 22-23 percent. This kind of feed is suitable for prolonged storage. After 5-7 days the straw treated with concentrated alkali can be fed freely to the animals.

The technology for alkali treatment of straw which is used in the GDR is also becoming widespread. It involves treating the straw with 6 liters of a 24-percent solution of caustic soda per 100 kilograms of the prepared product.

Alkali treatment increases the edibility and digestibility of the straw. The nutritive content of a kilogram of it increases 1.5-2-fold. The greatest effectiveness from treating straw by the "dry" method is achieved when it is used in combination with granulated or briquette mixtures.

The All-Union Scientific Research Institute of Feeds and other scientific institutions have developed and approved a number of formulas for granulated and briquette mixtures which include straw that has been treated with alkali (6 liters of

24-percent caustic soda per quintal of straw), barley wastes and mineral supplements. The formulas for granulated feed mixtures for large horned cattle are presented in Table 2.

When these mixtures were used in experiments the milk yield increased by 15-20 percent with a reduction of expenditures of feed units per unit of output by 10-16 percent and concentrated feeds--by 30-50 percent. The daily weight gain of the young large horned cattle amounted to 1,100-1,380 grams.

Positive results are also achieved when the straw is also treated with milk of lime (90 kilograms of lime paste or 30 kilograms of quicklime per 2-2.5 cubic meters of water) with or without washing, soda ash (4-5 kilograms of soda per 80-100 kilograms of water) with subsequent thermal treatment, 20-25 percent ammonia water or liquid ammonia (per ton of straw, 30 kilograms of liquid ammonia). In all cases the nutritive content of the winter straw increased 1.5-2-fold.

One should especially discuss the importance of grass meal and chopped grass in winter rations. These feeds are distinguished by high energy, protein and vitamin value; they are practically as good as many concentrated feeds in terms of these indicators; and in terms of certain elements they even surpass them. Therefore it is necessary to devote attention to efficient utilization of these feeds.

Experienced animal husbandry workers are correct in using grass meal as part of concentrated mixtures or including it full-ration granules and briquettes. Then the effect of grass meal and chopped grass is equal to that of high-energy protein-vitamin concentrated feeds.

It is appropriate here to mention once again the need for strict accounting for and efficient utilization of concentrated feeds, especially grain forage, which certain farms feed even to ruminants not as a balancing supplement, but as the basic feed for making up for the shortage of energy in the ration and, as a rule, in unprepared form.

This practice cannot be justified either from the economic or from the zootechnical standpoint since it leads to an unjustified overexpenditure of feeds which are in short supply, increased cost of animal husbandry products, disturbance of the animals' metabolism, and a reduction of the KPD of bulk feeds.

It has been established that 100-150 feed units are lost from each ton of grain that is fed to animals without being prepared.

Moreover, by using the simplest devices for preparing and treating grain (grinding, crushing, mixing and enriching it with macro- and micro-elements that are in short supply as well as vitamins), it is possible to double its effectiveness. Now practically all farms are able to prepare a simple mixture of concentrated feeds and enrich it with synthetic nitrogen substances, mineral salts and vitamins. It will be especially important to take advantage of this possibility for economical utilization of concentrated feeds during this winter period.

Thus the farms are armed with a whole arsenal of devices that make it possible, by considering the quality of the feeds, to increase their nutritive content and the effectiveness of their utilization and, thereby, to conduct the wintering of the livestock successfully and to increase the production of animal husbandry products.

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LIVESTOCK

LAG IN CONSTRUCTION OF POULTRY BREEDING PROJECTS SCORED

Moscow SEL'SKAYA ZHIZN' in Russian 29 Dec 81 p 2

/Article by V. Kulikov: "At Poultry Breeding Projects"/

/Text/ The builders of the Odessapromstroy Trust of the USSR Ministry of Industrial Construction began the construction of the Chernomorskaya Poultry Factory not far from Odessa only last year. This enterprise designed for the annual breeding of 6.6 million broilers is now on the eve of commissioning. Nearby the collective of the Odessasel'stroy Trust of the Ukrainian SSR Ministry of Rural Construction is building the Odessa (egg specialization) Factory and the Viktorovskaya and Belgorod-Dnestrovskiy factories for meat production. The builders' energy and the constant attention to key projects on the part of local party, Soviet and economic bodies also bring good results here.

When the builders of the Dneprosel'stroy Trust celebrated the prescheduled commissioning of the first stage of the Orel Poultry Factory in Dnepropetrovskaya Oblast, they promised to also commission its second stage ahead of schedule--this year. They kept their word. The labor collectives building industrial poultry breeding projects in Chelyabinskaya, Kemerovskaya, Amurskaya, Arkhangel'skaya and Sakhalinskaya Oblasts, in Checheno-Ingushetia and in the Tatar ASSR are successfully fulfilling their high obligations.

Builders know that during the 11th Five-Year Plan the average annual production of eggs is to be increased to 72 billion and poultry meat production is to rise sharply. The attainment of such a level also depends on how the program for an increase in capacities is fulfilled in this sector. A total of 215 enterprises, including 105 poultry factories of meat specialization, 55 factories for egg production, 55 pedigree farms and for the breeding of young stock are now being built in the system of the USSR Administration of Poultry Raising Industry. A total of 198 projects should be put into operation right now. Unfortunately, as yet work is not carried out successfully at all the projects. The volumes of work are fulfilled in accordance with the plan on 56 construction projects. On 32 start-up projects less than one-half of the assignment was fulfilled.

In Yaroslavskaya Oblast capacities for 3 million broilers at the Yaroslavl' Factory and for 580,000 laying hens at Volzhanka were supposed to be commissioned now. The construction is under the threat of disruption. The Tsentral'naya Broiler Factory was being actively built in Vladimirskaya Oblast. Recently, however, the

collective of the mobile mechanized column-178 of the Vladimir Territorial Administration of Construction with its subcontractors has not kept to the established schedules. There is also a slack at the Rossiya Poultry Factory in Orenburgskaya Oblast. The lag at this projects amounts to almost 1 million rubles worth of construction and installation work.

Work also lags behind the envisaged schedules at the following poultry factories: Ivanovo in Ivanovskaya Oblast, Bratsk in Irkutskaya Oblast, Sredneural'sk in Sverdlovskaya Oblast, Shirino in Tul'skaya Oblast, Timashevo and Podbel'skaya in Kuybyshevskaya Oblast, Zarechnaya in Penzenskaya Oblast, Kansk in Krasnoyarskiy Kray, Udmurt, in Udmurtskaya ASSR, Sibirskaya and Komsomol'skaya in Altay and Sotnikovskaya in Buryatia.

The collectives building poultry factories in Uzbekistan, the Ukraine and Turkmenia deserve a serious rebuke.

The course of construction of state pedigree poultry plants is of special concern. In Penzenskaya Oblast at the Kalinovskiy and Svetlopolyanskiy plants work worth almost $\frac{1}{2}$ million rubles was underfulfilled and at the Krasnokutsk Plant in Saratovskaya Oblast the lag is also substantial. Zonal experimental stations for poultry breeding--Dal'nevostochnaya in Khabarovskiy Kray and Belorusskaya in the Belorussian SSSR--are being built slowly.

A number of pedigree plants are being established with complete sets of imported equipment. The Podkumskiy Plant in Stavropol'skiy Kray is one of them. At first glance the collective of Stavropol'sel'stroy is overfulfilling the plans for construction and installation work. However, the installation of expensive structures of 57 wings of poultry houses is carried out at outstripping rates on five farms, but builders do not rush with the installation of industrial equipment. It is carried out only in six wings. The construction of feed enrichment and sanitary slaughter shops, feed and egg warehouses, incubator houses, the gas pipeline, the boiler room and sludge beds of cleaning installations is also lagging.

The activity of the system of the USSR Administration of Poultry Raising has long been recognized. The efficiency of capital investments in the establishment of industrial poultry breeding projects is high. Therefore, it is important to take into consideration the lessons of the year, to avoid the lag on the construction projects of this sector in the future and to see to it that all of them are put into operation on the dates scheduled.

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REGIONAL DEVELOPMENT

TECHNICAL-SCIENTIFIC PROGRESS, GOALS IN UKRAINE OUTLINED

Kiev EKONOMIKA SOVETSKOY UKRAINY in Russian No 11, Nov 81 pp 12-20

[Article by A. Storozhuk, director of the Ukrainian Scientific Research Institute of Economics and Organization of Agriculture imeni A. G. Shlikhter, professor, doctor of economic sciences: "Scientific and Technical Progress and the Development of Agriculture in the Ukraine"]

[Text] The scientifically substantiated program for the country's further economic and social development, which was comprehensively substantiated both theoretically and politically in the accountability report of the CPSU Central Committee to the 26th party congress, was embodied in the document adopted by the congress--"Main Directions for the Economic and Social Development of the USSR During 1981-1985 and the Period up to 1990."

In his report at the party congress general secretary of the CPSU Central Committee L. I. Brezhnev noted that ". . . the conditions under which the national economy will be developing in the 1980's make it even more necessary to accelerate scientific and technical progress," and that "the close integration of science and production is a persistent requirement of the modern age."

Guided by the decisions of the 26th congress, the Communist Party of the Soviet Union, all levels of administration of the economy, production and scientific collectives are comprehensively weighing what has been achieved in past years from the standpoint of revealing progressive tendencies and contributing to their development, and they are also studying those phenomena which exert an undesirable influence on further progress, evaluating their causes and taking the necessary measures for increasing the efficiency and improving the quality of all work.

Agriculture in the Ukrainian SSR is faced with responsible tasks. Under the past five-year plan the average annual volume of production of agricultural products in the republic amounted to 28.5 billion rubles, and under the next one it is to be increased to 31.9-32.5 billion rubles. The present level of the population's consumption of food products provides the necessary amount of calories and even somewhat exceeds the norm. But with the surplus of carbohydrates in the food rations that is caused by excessive consumption of bread products and potatoes, there is a shortage of protein, above all animal protein. The amount of fruits and vegetables that are consumed is less than that determined by efficient nutritional norms.

But for the republic's agriculture the matter goes beyond simply providing the population with food according to scientifically substantiated norms; after all, it is necessary to deliver products to the union fund, to have reserves and so forth. In a word, all these circumstances require a significant increase in the production of almost all kinds of agricultural products, and above all grain (especially feed), sugar beets and sunflower seeds, in which the Ukrainian SSR specializes, and also animal husbandry products, vegetables, fruits and grapes.

In agriculture, where an essential influence is exerted by natural factors which are difficult to control or completely uncontrollable, it is incomparably more complicated to increase the volumes of the production of products than it is in industry or in other branches of material production. Therefore science plays an extremely large role in deciding the best way to use existing production resources for implementing the food program. Soviet scientists in conjunction with planning and economic agencies, on the basis of fundamental instructions of the 26th CPSU Congress, must also answer the following question: what should be the economic mechanism for management and the organizational forms of production so that production resources will be utilized optimally.

"A characteristic feature of the new five-year plan," noted N. A. Tikhonov, a member of the Politbureau of the CPSU Central Committee and chairman of the USSR Council of Ministers, in his report at the 26th party congress, "consists in that it envisions that the growth of final national economic results will be more rapid than the increase in labor and material expenditures, including capital investments." The Main Directions regard the ensurance of efficient and economical utilization of natural, material and labor resources as the decisive and the most effective method of multiplying the country's national wealth and rapidly increasing socialist accumulations and resources for consumption.

When describing the resource base for agriculture in the Ukrainian SSR, the question of the land is the first to arise. One cannot hope to increase production by bringing considerably more land into agricultural circulation, although there are certain reserves here and they should be utilized: they include draining some of the marshes, recultivating the land, digging up tree stumps, filling in ravines, better organizing the road network and so forth.

What with the shortage of land resources, the main thing is to organize more productive utilization of each hectare of land, to think of all the aspects of transforming the land and to fight against erosion processes which exert a destabilizing influence on the economy. Just the washing away of soil alone removes an immense quantity of nutritive substances from the fields each year.

Scientists of the republic have developed comprehensive technology for protecting the soil from erosion which is applied on significant areas. Subsoil tilling for the 1980 harvest was conducted on 4.1 million hectares, including with the use of moldboards on 2.7 million hectares. Devices such as cutting slits in the soil, contour cultivation of the fields and planting agricultural crops in strips have been widely carried out. Among the measures for stepping up the fight against erosion processes, a good deal of attention is being devoted to eliminating the so-called "production" erosion of the soil. The introduction of technologies that disturb the soil less can and should provide a great deal here.

An appraisal of the soil (that is, agro-industrial classification of it in terms of internal properties) and an economic evaluation of the land have been conducted in the Ukraine. This makes it possible to evaluate on a comparable basis the indicators for the volume of production and the incomes of individual farms and regions, to reveal who is utilizing the land better and who is doing it worse, and thus to reveal reserves for utilizing it more efficiently. Not only plowed land, but also natural feed lands and perennial plantings have been evaluated, and partial evaluations have also been made--for the group of grain crops, corn for grain, sugar beets, sunflowers, long-fibered flax and potatoes.

The general and particular evaluations of the land are presented by means of three indicators: gross output (productivity), recouping of expenditures and differential income--that is, the additional part of the income obtained from relatively better land.

This year, the Presidium of the Ukrainian SSR Academy of Sciences and the Presidium of the Southern Division of VASKhNIL at a joint meeting determined the primary tasks for scientists in the matter of developing scientific fundamentals for efficient utilization, preservation and reproduction of land resources in the republic under the current five-year plan.

One-third of the territory in the Ukrainian SSR is in the zone with inadequate or unstable moisture supply, and therefore irrigation is a most important means of obtaining large and stable yields of agricultural crops. During 1976-1980 the republic put 589,000 hectares of irrigated land into agricultural circulation, and by 1980 the overall area of them amounted to 2,014,000 hectares. Under the Eleventh Five-Year Plan, through state capital investment, another 503,000 hectares of irrigated land will go into operation. But the area that is suitable for irrigation exceeds this indicator 5-6-fold, which creates favorable possibilities for expanding irrigation farming and creating zones with guaranteed yields.

Unfortunately, water supplies are limited in the republic, fresh water is a limiting resource, and in dry years there is a shortage of water. This problem can be solved radically by utilizing water from the Danube, which distributes part of its water in the Ukraine. This is not an inexpensive program and from the ecological standpoint it is fairly complex. The republic has developed a general schema for comprehensive utilization and protection of water resources which envisions, in particular, the creation of an automated control system for water resources of the main water artery of the Ukraine--the Dnepr. Since the implementation of large-scale plans for water management construction involve essential changes in the structure and distribution of agricultural products, scientists have already begun to study the possible variants of its organization in recently irrigated regions.

With a shortage of water it becomes most important to expend it economically and extensively apply methods and techniques of irrigation that require less water. The least expenditure of water is achieved with fine spray sprinkling and drop irrigation. Far from all farms use irrigation water according to scientific recommendations, and their expenditures are still great. In order to utilize this resource economically, it would be expedient, in our opinion, to study the question of introducing payments for water for farms that obtain it for irrigation.

One of the reasons for the inadequate effectiveness of capital investments in land reclamation (particularly irrigation) is the fact that the farms frequently do not have the necessary funds and material resources for organizational and technical measures related to preparing for the assimilation of reclaimed land.

Before the revolution the Ukraine produced 36,000 tons of mineral fertilizers (in conventional units), in 1940--a little more than 1 million tons and in 1980--20 million tons. In 1980 the republic's agriculture received 16 million tons of fertilizers and in 1985 20.3 million tons of them will be delivered to the kolkhozes and sovkhozes, which will undoubtedly be a great addition, but mineral fertilizers are still not sufficient to create the necessary conditions of soil nutrition for the plants. Scientific programming of the productivity of agricultural crops also impedes this.

When there is a shortage of mineral fertilizers they must be sent in the necessary quantity to places where they will produce the greatest return. Herein lies the task of both planning and agricultural agencies and the farms themselves.

More attention should be given to the fight against weeds which absorb the nutritive substances in the soil. To this end the Ukrainian SSR has approved a special comprehensive technological program that envisions extensive participation of scientific collectives.

With the increased application of chemical products in agriculture the problem of protecting the natural environment becomes more and more critical. Thus, for example, it takes only 12.5 grams of petroleum products to make 1,000 liters of water unsuitable for irrigation. Anthropogenic factors now have a stronger effect on water resources in the Don basin and the Dnepr area. The water basin of the Ukraine is being polluted mainly by salts.

A great deal of importance is attached to the struggle for the purity of the water and environment in the republic. During 1976-1980 an average of 239 million rubles were spent annually for this. Large amounts of money are being used for these measures under the current five-year plan as well. Questions of efficient utilization of natural resources have been properly reflected in the plans for scientific research projects. The programs of the republic's scientists include such areas of research as the development of the fundamentals of plant nutrition under the conditions of intensification; prognostication of the evolution of the soil cover under the conditions of intensive chemization; the development of effective methods of regulating the water and salt conditions of irrigated soil; the development of hygienically permissible norms for the content of harmful substances in the soil, and so forth.

It will be more difficult to provide the national economy and its agricultural branch with energy and fuel in the future. The decree adopted in July, 1981 by the CPSU Central Committee and the USSR Council of Ministers, "On Stepping Up the Work for Economical and Efficient Utilization of Raw, Fuel-Energy and Other Material Resources," notes that the extraction of raw material and fuel is becoming more and more expensive and that the supplies of minerals are not being restored. The Communist Party and the Soviet state consider it necessary to radically improve

all of the work for economical and efficient utilization of fuel, energy and also raw and processed materials. Our scientific and technical policy is oriented toward this.

A reduction of the energy expenditures required to obtain a unit of output is one of the most important tasks of agricultural production. Many technological processes in this branch are not energy efficient enough; fuel and energy are not always used intelligently for lighting and heating production and residential facilities. Obviously the planning documents and the reports from agricultural enterprises should include indicators of the energy-intensiveness of the products so that this most important aspect of the production efficiency will be reflected.

The increased material-intensiveness of agricultural production is objectively conditioned. It is brought about by many factors, and above all by the replacement of live labor with embodied labor. According to the calculations of our institute's scientists, complete expenditures of live labor on kolkhozes of the republic per 100 rubles of gross output in the branch decreased during 1965-1980 from 83 to 54 man-hours, and complete expenditures of embodied labor increased from 35 to 49 man-hours.

The fact that the development of agriculture is more rapid in zones of the Ukraine that are relatively less suitable and the development of the branches of animal husbandry which are more material-intensive than those of crop growing also lead to increasing the material-intensiveness of agricultural production. But subjective factors also influence the increased material-intensive production in agriculture. These are related to the fact that technical means and other material resources are not utilized efficiently enough.

Improving the utilization of the labor force in agriculture is a most important economic and political task. The reduction of the birth rate of the rural population and the migration of rural residents to the cities involve an ever greater reduction in the number of working hands in the branch. And although labor productivity in agriculture is steadily increasing, the still decreasing number of people employed in agricultural production cannot be compensated for fully by the greater technical support, as a result of which even now many regions of the Ukrainian SSR do not have enough labor force to conduct agricultural work within the optimal time periods. The situation with machine operator personnel is especially disconcerting. There are not enough of them for productive utilization of the technical equipment. In order to determine the optimal requirement for them, our institution has developed the corresponding normatives for the various zones of the republic.

The situation with the labor force can and should be alleviated with a simultaneous solution to the problem of further increasing labor productivity by raising the level of mechanization, making it comprehensive in all parts of the technological process and qualitatively improving the material and technical base for agricultural production. But it is costly to replace live labor with technical equipment. According to the calculations we made in the institute, at the present time it takes four times more money to replace one average annual worker who has left agriculture than it did 15 years ago.

Under the Tenth Five-Year Plan, 42 percent of the fixed production capital in Ukrainian agriculture was updated. At the end of 1980 the energy availability for the labor of one worker employed in agricultural production reached 18.6 horsepower; there were 469,000 tractors in the branch (including those on which land reclamation machines and other machines were installed) with a total capacity of the engines of 33.7 million horsepower, and there were 318,000 trucks with an overall capacity of 1,123,000 tons.

But still the capital and energy availability for agriculture is inadequate. We do not have the necessary proportions between tractors and other working machines. The kolkhozes and sovkhoses have still not been fully provided with technological transportation, and the structure of this transportation is in need of improvement. One can give the following figures as an example. According to calculations of scientists from our institute, for every 1,000 hectares of plowed land on the kolkhozes there should be 8-9 trucks while there are actually 7.2, and 40.4 percent of them have been in operation for more than 8 years. In agriculture 70-80 percent of the cargo is bulk, but dump trucks comprise only 35 percent of the automotive fleet while the calculated need for them is up to 50-60 percent. The average cargo capacity of available technological automotive transportation is 3 tons instead of the necessary 3.5-4.5 tons.

Far from all buildings and structures in animal husbandry meet the requirements of new technologies. The material and technical base for feed production and the storage and processing of agricultural products is also outdated.

Under the Eleventh Five-Year Plan we shall continue the technical rearmament of agriculture on the basis of new technical equipment and complete the comprehensive mechanization of the production of many agricultural crops with extensive application of progressive technologies. But here it is necessary for the technical means to be delivered to agricultural enterprises not as individual machines, but in the necessary sets which are coordinated in terms of productivity, technological speed and other parameters.

All branches of Ukrainian agriculture will be further developed under the Eleventh Five-Year Plan. Thus the average annual production of grain is to be increased from 43.2 to 51-52 million tons, sugar beets--from 53.9 to 56-57 million tons, sunflower seeds--from 2.4 to 2.9 million tons, long-fibered flax--from 124,500 to 140,000 tons, potatoes--from 20.5 to 21.5 million tons, vegetables--from 7.6 to 7.9 million tons, fruits and berries--from 3.1 to 3.7 million tons, grapes--from 0.8 to 1.1 million tons, feeds for public animal husbandry--from 69.9 million tons of feed units (average for Tenth Five-Year Plan) to 90-92 million tons of feed units on kolkhozes and state farms in 1985.

The average annual volume of meat production (in slaughtered weight) under the Tenth Five-Year Plan was 3,471,000 tons, and under the Eleventh it is to be increased to 3.9-4.1 million tons. There is also to be an increase in the production of milk (from 21.8 to 22.5-23 million tons) and eggs (from 13.5 to 14.8 billion).

Since the possibilities of expanding the overall areas planted in agricultural crops in the republic are very meager, the production volumes will be increased as a result of intensification. Most of the increase in the gross yields of grain crops and all of that of sugar beets should be achieved through increased productivity. The same can be said about potatoes. But in this case--even with increased productivity of this crop--it is expedient to reduce the areas planted in it somewhat.

Science is called upon to make a large contribution to providing for the increased productivity of agricultural crops. Its main task in this matter is to create new, more productive strains and hybrids, to improve agrotechnology, and to develop methods of obtaining programmed yields and introduce them into practice.

Even now agriculture has fairly good strains of grain, industrial and other crops with a high genetic potential for productivity. One can point out such new regionalized strains of winter wheat as Akhtyrchanka, Dnepropetrovskaya-846, Kiyanka, Mironovskaya-25, Odesskaya polukarlikovaya and Khar'kovskaya-81. The Stepnyak and Chayka strains of winter wheat demonstrated their high merits in competitive strain testing.

The best strains of winter rye include Niva and Odesskaya Tetra; spring barley--Donetskiy-8, Nosovski-9 and Vinnitskiy-7; and peas--Neosypayushchiysya-1 and Uladovski-10. Scientists have created the first domestic hybrid of sunflowers, Rassvet. According to data from strain testing stations of Odesskaya Oblast, its productivity amounts to 28-32.4 quintals per hectare. A number of strains of vegetables that are suitable for machine harvesting have been created. New strains of alfalfa with increased feed productivity have been isolated.

But even the new strains do not entirely satisfy agricultural production, especially in terms of the stability of the harvests. Therefore, under the new five-year plan selection institutions are working to isolate more productive strains of agricultural crops. We are speaking of obtaining strains of winter wheat with a potential productivity of 80-90 quintals per hectare, spring wheat--40-60, winter rye--50-65, winter barley--65-75, spring barley--60-70, oats--45-60, peas--45-50, and hybrids of corn on irrigated land--130 and on nonirrigated land--70-90 quintals per hectare. Under the current five-year plan it is planned to create 18 hybrids of one-seed sugar beets on a sterile basis that are resistant to bolting and diseases. The work programs of the scientists include isolating strains and hybrids of potatoes with a potential productivity of 350-550 quintals per hectare.

During the years of the Eleventh Five-Year Plan the progressive industrial technologies which have been developed by scientists for the production of the most important agricultural crops will become widespread. In addition to increasing productivity, they provide for increased labor productivity. Such technologies exist for cultivating corn for grain, sugar beets (and here, because of this technology, their productivity reaches 400-500 quintals per hectare), sunflowers, early potatoes, tomatoes on irrigated land with combine harvesting, carrots, onions, and also a number of other vegetable crops. Scientists of the Ukrainian Scientific Research Institute of Irrigation Farming have created a technology for cultivating soybeans which makes it possible to gather 30 quintals of products from each hectare planted in them. Highly effective technologies are also being introduced for raising feed root crops and corn for silage on irrigated land.

In the area of animal husbandry scientists are setting themselves the task of developing technologies which will make it possible to increase the average daily weight gain of large horned cattle on fattening to 1,130-1,300 grams, and hogs--to 700-750 grams. Highly productive selection herds of the main breeds of cows have been created. In the next few years it is intended to create types and lines of animals of these breeds which will provide for obtaining 5,000-7,000 kilograms of milk per year from each cow. It is also intended to isolate crossbreeds of poultry which will annually produce up to 280 eggs per laying hen.

The 26th CPSU Congress determined that the main factor in economic growth is increased labor productivity. Under the current five-year plan in the public sector of agricultural production it will be necessary to provide for an increase (as compared to the past five-year plan) in labor productivity in the amount of 24 percent, while during 1976-1980 the corresponding indicator (on an annual average) amounted to 20 percent.

During the years of the Tenth Five-Year Plan in the Ukrainian SSR labor productivity increased in all branches of agricultural production, and conditions were created for its further increase. But, despite the increased labor productivity, the production of agricultural products became more expensive. Thus if one compares the cost of the production of products on the kolkhozes during 1976-1980 and 1971-1975, under the Tenth Five-Year Plan it increased as follows (per one quintal): grain (not including corn)--0.61 rubles, corn grain--0.98, sugar beets--0.21, sunflower seeds--1.58, potatoes--1.93, vegetables--0.07, milk--4.82, weight gain of large horned cattle--33.26 (including interfarm organizations), weight gain of hogs--27.08 (including interfarm organizations), every thousand eggs--5.99 (including interfarm organizations), and wool--172.49 rubles.

While during 1966-1970 the production expenditures of the kolkhozes per 100 rubles of gross output of agricultural branches amounted to 63.73 rubles, during 1971-1975 it increased to 74.88, and in 1976-1980--to 91.33 rubles. The production of the gross output on the kolkhozes per 100 rubles of fixed production capital for agricultural purposes decreased from 86.2 rubles in 1971-1975 to 61.6 rubles in 1976-1980.

On an average for 1976-1980 the cost of seeds used per 100 rubles of gross output of crop growing products increased (as compared to 1971-1975) by 2.33 rubles. For fertilizers this increase was 2.38 rubles (the cost of one quintal of active substance of fertilizers increased by 1.09 rubles), for fuel and lubricants--0.2, expenditures on current repair--0.93, expenditures on automotive transportation--0.94, amortization--1.21, and other direct expenditures (except wages)--2.54 rubles.

Kolkhoz expenditures on the production of every 100 rubles' worth of gross output of agricultural products were higher in 1976-1980 than in 1971-1975: for feeds--by 12.37 rubles, amortization--by 2.73, current repair--by 0.11, and other direct expenditures (except wages)--by 2.75 rubles. The production cost of one quintal of feed units increased by 1.43 rubles during this time.

The increased production cost of agricultural products was brought about largely by the increased cost of production capital delivered to agriculture by industry. This practice, which does not compensate agriculture sufficiently for the additional expenditures caused by increased prices, is inadmissible. This was also amplified in the decisions of the July (1978) Plenum of the CPSU Central Committee which made it incumbent on the corresponding departments to deal more profoundly with problems of price setting for industrial products that are delivered to rural areas.

New wholesale prices for industrial products and new tariffs for electric and thermal power will be introduced in 1982. Thus material supplies used in agriculture will become even more expensive. It is possible to avoid a reduction of the incomes of the kolkhozes and sovkhozes in two ways. The first is to retain the existing practice of having two price lists with a simultaneous increase in the amounts of compensation for agriculture from the state budget. The second way consists in refraining from this practice and raising the procurement prices for agricultural products by an amount that is equal to the increase of additional agricultural expenditures. In our opinion, the latter is more expedient.

In any case, the solution to this problem requires the development of the corresponding normative base, and also methods of measurement and planned control over the price balance. It is necessary to optimize the model of the financial books of the agricultural branch so that prices, credit funds and budget subsidies will be comprehensively substantiated and equalized.

In the decree of the CPSU Central Committee and the USSR Council of Ministers adopted in November, 1980, "On Improving Planning and Economic Stimulation of the Production and Procurement of Agricultural Products," attention is drawn to the need to step up the work for developing and promptly revising the system of norms and normatives for planning production, material and technical support and capital construction in agriculture at all levels of planning.

The corresponding departments and scientific collectives have already done a good deal in this area. They have developed normatives for the labor-intensiveness of production, its capital-intensiveness and material-intensiveness, and also normatives for the general economic profitability of agricultural production for various rates of increase of the gross output. The normatives for the general economic profitability are coordinated by the USSR Gosplan and approved by the USSR Ministry of Agriculture. According to these normatives, in order to provide for an annual increase in the production of agricultural products in the range of 4-5 percent, the farms of the Ukraine must have a corresponding level of profitability of 38.4-41.7 percent with the following differentiation for the various zones: steppe--42.5-46.2, forest steppe--36.2-39.1 percent, and the forested area--39.6-42.8 percent.

The Institute of Economics of the Ukrainian SSR Academy of Sciences in conjunction with the Ukrainian SSR Gosplan, the Ukrainian SSR Central Statistical Administration, the republic Ministry of Agriculture and the Ukrainian SSR State Committee for Prices, has developed methods for determining and regulating the ratios of prices for products and services in the public sector of agriculture of the agro-industrial complex.

In order for agricultural enterprises to expend their funds economically, it is very important for the farms to extensively introduce the experimentally tested normative method of intrafarm planning. Our institute, in conjunction with the Ukrainian SSR Ministry of Agriculture, has prepared a methodology for the development and application of consolidated normatives of direct expenditures per hectare of planted area, head of animals and unit of output for intrafarm planning in the various zones of the republic. The normatives themselves have also been developed.

Under the past five-year plan on the kolkhozes of the republic production expenditures increased much more rapidly than did the sales prices for agricultural products, which brought about a reduction in the profitability of production. And this, naturally, reduced the farms' possibilities of raising the level of intensiveness of production, for the wages of the kolkhoz workers did not decrease, but increased. Under the Ninth Five-Year Plan, the mass of net income of the kolkhozes per one hectare of agricultural land was 73 rubles, and under the Tenth it decreased to 54 rubles, while deductions from the gross income into accumulation funds decreased from 54.9 to 41.4 rubles.

The present level of profitability of agricultural production and the existence of internal monetary resources on the farms are inadequate for fully carrying out the tasks facing the kolkhozes and sovkhoses regarding increased production and the social and cultural development of rural areas. Therefore, in addition to maximum mobilization of internal reserves for making the production of products less expensive, one should, taking into account the financial possibilities of the state, study the question of increasing procurement prices for a number of agricultural products. After all, the prices are also a planning normative which should provide for the normative profitability of production. The decree of the CPSU Central Committee and the USSR Council of Ministers, "On Improving Planning and Economic Stimulation of the Production and Procurement of Agricultural Products," is oriented toward this. It discusses the need to develop proposals for further improvement of procurement prices for agricultural products with the goal of creating conditions for strengthening autonomous financing and providing for expanded reproduction on the kolkhozes and sovkhoses.

While raising the overall level of profitability of agricultural production, it is necessary to eliminate excessive disparities in the recouping of expenditures on individual products, especially the losses that are incurred from the production of certain of them. Under the Tenth Five-Year Plan the profitability of production of all of the main agricultural products (except fruits) on the kolkhozes decreased (as compared to the Ninth Five-Year Plan). Potatoes, vegetables, milk and pork were produced at a loss. The losses from the production of wool increased even more.

The most profitable products in crop growing branches under the Tenth Five-Year Plan were sunflower seeds (126.7 percent) and grain (76.8 percent), and in animal husbandry--chicken eggs (17.6 percent).

Problems of the ratios among procurement prices for interchangeable products, their territorial differentiation, accounting for the qualitative indicators of products in prices, calculations for drying and cleaning substandard grain, and a number of others have still not been fully solved.

In order to provide for a correct correlation between procurement plans for agricultural products and the farms' resources, one should accelerate the development of the corresponding normative base. It is necessary to have normatives for comprehensive evaluation of the resources of the farms which would make it possible to assign them equally difficult plans. The experiment in applying such normatives, developed by our institute, in Volynskaya Oblast produced positive results. We have also developed methods for material incentives to take on more difficult plans for the procurement of agricultural products which, in our opinion, contribute to eliminating shortcomings that exist in this area.

The fulfillment of plans for the development of agricultural production depends not only on the availability of the necessary resources and the ability to handle them in the best way, but also on the motivation on the part of the workers in production to do high-quality work, and this, in turn, is determined largely by the structure of the wage system. The decisions of the 26th CPSU Congress envision providing for increasing the dependency of the amounts of wages on the final results of work, labor productivity and product quality.

The Ukrainian Scientific Research Institute of Economics and Organization of Agriculture imeni A. G. Shlikhter, on an order from the Ukrainian Ministry of Agriculture, proposed a draft of new recommendations for wages on the kolkhozes of the republic for the current five-year plan. It takes into account changes in working conditions related to raising the level of mechanization, the degree of concentration, production specialization and other factors which influence the level and forms of wages.

The draft retains those presently existing provisions which have proved their effectiveness in practice. In particular, under the Eleventh Five-Year Plan it is recommended that the kolkhozes of all branches of public production apply the job rate plus bonus system of wages with partial and temporary advanced payments. A principally new aspect here is that while in the past the payments for the products were established primarily in terms of the quantity of products produced, in the next five years the rates will take into account the quality of the products produced as well as their quantity.

Methods have also been suggested for calculating job rate payments for all stages of the production of milk, with the application of progressive flow line-shop technology of its production.

The system of additional material incentives for kolkhoz workers has been changed in the direction of strengthening the connection between the level of material incentives and the quality of the products produced or the work performed.

A great deal of attention is being devoted to motivating workers of the branch to reduce losses during harvesting.

Changes have been made in the system of wages for managers and specialists. Volume indicators which determine the amounts of salaries have been refined, as have the conditions for awarding bonuses to this category of workers. In particular, coefficients have been suggested for equalizing the amount of the gross income,

taking into account the various levels of labor-intensiveness and income production from agricultural products, and the coefficients of the intensiveness of the utilization of land have been differentiated for six natural and economic zones (instead of three) and so forth. The draft of the recommendations has been approved by the republic Council of Kolkhozes and the Ukrainian Ministry of Agriculture.

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SUBSIDIARY FARM DEVELOPMENT IN TATAR ASSR PETROLEUM INDUSTRY

Moscow IZVESTIYA in Russian 9 Dec 81 p 2

/Article: "What a Subsidiary Farm Can Give"/

/Text/ The 2 billionth ton of petroleum since the beginning of operations of the deposits was extracted in Tataria approximately 2 months ago. Comrade L. I. Brezhnev warmly congratulated the petroleum workers of the autonomous republic on this remarkable labor victory. A strong collective emerged and highly skilled, experienced cadres were formed there. In Tataria's oil fields the standard of production reached a high level and many valuable initiatives and innovations, new advanced technologies and modern methods of organization of production and labor originated and became widespread throughout the Union.

The high achievements did not come by themselves. They were the result of the overall approach to the solution of diverse problems in people's life and activity. To the credit of party and Soviet bodies and of economic managers of the republic's petroleum regions be it said that close attention is paid there every day to the further development of production, as well as to the problems of general, social and cultural construction organically united with it. The construction of housing, roads, houses of culture, schools, hospitals, institutions of domestic services for the public, sanatoria and boarding houses and constant concern for man's harmonious development--all these have now become the remarkable features of the appearance of Tatarian petroleum regions.

A new facet in the life of modern production has been sharply defined in the republic in the last few years. This is the subsidiary farm called upon to provide workers and employees with food products. Such a trend directly meets the task set by the party, that is, to improve the supply of meat, milk, vegetables, fruits and other products of agriculture for the population. The November (1981) Plenum of the CPSU Central Committee especially stressed that a regular supply of high-

quality food products for the people requires good work both on the part of agriculture and many other sectors. Considerable experience in this important matter was accumulated in the Tatar ASSR.

The Neftyanik Sovkhoz

This is the largest subsidiary farm subordinated to the workers' supply administration in the Tatneft' Association. Incidentally, in the scale and basic technical and economic indicators Neftyanik holds the leading place in Al'met'yevskiy Rayon, leaving behind many kolkhozes and sovkhozes of the republic's Ministry of Agriculture. Neftyanik's land resources include almost 10,000 hectares, among which agricultural land occupies 8,582 hectares and arable land, 6,674 hectares. We visited the fields and farms of this sovkhoz, hothouses and the beehive. Intense work was in full swing everywhere. R. Kayumov, director of this sovkhoz, has many cares. The farm is big and he must keep an eye on everything and foresee everything.

"We have a total of 2,100 head of large-horned cattle, including 600 milch cows," says Rafayez Gil'meraziyeovich. "Furthermore, we have a poultry farm of almost 100,000 chickens, a rabbit breeding farm and a horse farm. Add to this the vast grain fields, pastures and entire hothouse town in which we grow cucumbers, tomatoes, onions and vegetables for petroleum workers and you will see a large agricultural complex. Successful livestock wintering is the main task now. The summer was difficult and dry, nevertheless we produced the necessary minimum of feed. Specialists formulated a ration for the feeding of animals until the end of wintering. Stock preservation is the main task now."

Wherever we went, we saw what the director said. The repair of equipment was in full swing at the machine yard and livestock breeders and vegetable growers worked calmly and confidently. In general, it should be noted that under the complex conditions resulting from the unfavorable weather conditions no signs of confusion or of lack of confidence in one's strength are felt on Neftyanik. Everyone is convinced that the difficulties will be overcome without fail. As was apparent from observations and from numerous meetings with the farm's workers and specialists, the strong organic link existing between the Tatneft' Association and its subsidiary farms served as a firm basis for optimism. Problems in material and technical supply and in the construction of major projects and roads hardly exist there. Incidentally, new asphalted roads and large modern farms and fattening complexes attracted attention both on Neftyanik and on other subsidiary farms. Now, in winter, having some free labor and material resources, the Tatneft' Association is laying irrigation pipes in its rural shop and is building other projects. This confidence in constant support and help on the part of a large industrial complex is significantly reflected in the people's mood and in the productivity of their labor. We met with milker I. Sadykova. Before Neftyanik she worked on a farm of the Ministry of Agriculture. Of course, it is not a matter of comparison, nevertheless...

"It is better here," says Isfaniya Garipovna. "There is more order and there are more opportunities. Last year, on the average, I obtained 3,452 kg of milk per cow. This is not so bad for a nonspecialized farm. On the average, I earn 200 rubles per month."

The higher degree of concreteness and clarity of the final result of work is another remarkable feature of the subsidiary farm. If good work is done on the farm and in the field, there are more products in the restaurants of petroleum workers and in every family. Perhaps only subsidiary farms make it possible to maximally meet the needs of even a small group of people. For example, let us take koumiss. It is difficult to make its production profitable--labor expenditures are high and output is valued in kopecks. What sovkhos director will engage in an obviously unprofitable enterprise? However, since petroleum workers have their own sanatoria and dispensaries, where koumiss is used in treatment, they have undertaken its production on their own subsidiary farm. They keep a farm of 70 mares and give the curative and tasty drink to those who need it.

In the middle of the 1960's, when the first agrarian shop of Tatneft'--the Neftyanik Sovkhoz--was established, skeptical voices were heard often: Is this profitable? Is this independent action needed? Some time passed since then, there were ups and downs in the development of this subsidiary farm and not every year produced good results. Now, however, weighing both the economic and social consequences of Neftyanik's activity, the following indisputable main conclusion can be drawn: The rural subdivision of the industrial enterprise withstood the test of time and of life itself and demonstrated its validity convincingly.

Strategy and Tactics of Development

The experience of the Neftyanik Sovkhoz led to the conviction that it was necessary to build up the capacities of the rural shop of the Tatneft' Association. On the basis of this a special food program founded on scientifically substantiated standards of consumption of food products is being developed there. With due regard for this specific volumes of production of meat, milk, eggs, vegetables and other agricultural products have been determined. An overall plan for the establishment of new subsidiary farms and of their material and technical base has been prepared and is already being implemented. We visited the new Biryuchevka Sovkhoz--the subsidiary farm of the Aznakayevneft' Petroleum Extracting Administration. In contrast to Neftyanik, which in many respects developed spontaneously, following the urgent demands for a rapid development of food resources for the association's workers and employees, the new farm began its biography according to the strict laws of organization of a modern agricultural complex. With the help of the specialists of the rayon administration of agriculture all the necessary calculations were performed and a long-term plan was prepared. Realizing it, in 1 year workers utilized 1 million rubles in construction and installation work. They built highways and are engaged in the construction of housing and large modern livestock barns on former abandoned land.

The sovkhos set for itself the task of increasing meat production to 50 kg per member of a petroleum worker's family in its zone during this five-year plan. T. Rakhmankulov, director of this sovkhos, believes that there are all the conditions for the solution of this problem. The petroleum extracting administration treats its rural shop with thoughtfulness. It helps it with building materials and equipment. The sovkhos herd now has 700 head of large-horned cattle.

It should be noted that the worst and, in addition to this, weedy land was allocated to the new farm. However, the set of agrotechnical measures performed on schedule and in a high-quality manner and advanced methods of soil cultivation

(70 percent of the arable land--nonmoldboard method) made it possible to obtain a harvest twice as high as that obtained on neighboring sovkhoses and kolkhoses and exceeding the average indicator in the rayon by 3 quintals per hectare. Its farms were fully provided with feed and the average annual milk yield per cow was about 3,000 kg. Essentially, the herd was formed from cows culled by other farms.

"We believe," A. Mukhametzyanov, director-general of the Tatneft' Association, shared his views, "that all our petroleum cities and regions should have their subsidiary farms. We are going in this direction. Many farms have already been fully staffed. They have highly skilled agronomists, zootechnicians, veterinarians and engineers. A special division of agriculture was established in the association. We are now petitioning the creation of the post of deputy director-general of the association for subsidiary farms."

This year a great deal was done to strengthen the material and technical base of subsidiary farms. Six faced silo trenches, a hay warehouse, a stable for the feeding of 400 head of large-horned cattle, a stall for calves, grain warehouses and summer camps for cows and hogs were built and the construction of 11 cottage-type two-apartment houses with private plots is being completed. Many asphalted roads and asphalt covered grounds were built on the territory of sovkhoses.

An even greater volume of work is planned for the second year of the five-year plan. A set of major measures, including 32 points, was prepared. After coordination with party and Soviet bodies in rayons this plan will be approved at the council of directors of Tatneft'. A fuller provision of animal husbandry with its own feed is one of such significant measures, which is already being implemented. For this pipes have been brought to sovkhoses and installation work is being carried out. A total of 2,420 hectares, or 80 percent of the arable land, will be transferred to irrigation. A definite volume of work with an indication of specific schedules was assigned to every subdivision of the Tatneft' Association. The construction of residential two-apartment houses, a kindergarten with an elementary school, a central boiler room, a cow house, a mineral fertilizer warehouse, a telephone station, a hostel, a hay warehouse, feed shops for hogs and large-horned cattle, a hothouse and other important projects is envisaged. Even a cursory acquaintance with the envisaged program convinces us that a large agricultural complex is being established and is already producing perceptible results in the Tatneft' Association.

"In our rayon," says A. Bagautdinov, first secretary of the Al'met'yevskiy City Party Committee, "in addition to Neftyanik there are also 9 sovkhoses and 16 kolkhoses. The following is remarkable: A few years ago, discussing the experience of the best collectives at plenums and conferences, we mentioned the advanced farms of neighboring rayons as an example. Now we have our own example--the Neftyanik Sovkhoz--to imitate. For example, last year it occupied the first place in grain production in the rayon."

Essentially, a standard type of agricultural enterprise with an advanced agrotechnical caliber and with a high level of production mechanization is being born. This is understandable. Being one of the subdivisions of a powerful industrial association, the rural shop receives the most necessary and prompt help. Even under extremely difficult conditions caused by unfavorable weather conditions it is

safe against a sharp reduction in its production and social-general potential. The development of subsidiary farms of industrial enterprises is now gathering strength. They are being established in all the subdivisions of Tatneft' and at many plants and institutions.

The establishment of large rural shops of industrial enterprises can be called the strategic direction of the food program of the Tatneft' Association. Here, however, other ways of improving the supply of food products for workers are not ignored. Proprietary enterprise and an interested and creative attitude toward the important problem on the part of party and Soviet workers and managers of enterprises and institutions help to uncover and activate ever newer potentials for an increase in the production of meat, milk, vegetables and other agricultural products. Here is a simple example. A hog fattening house for 350 head was established in the Leninogori Administration of Drilling Operations. It is kept in the following manner. Every worker of this administration must deliver a pail of food waste to the fattening house once a week. When land is distributed for private subsidiary farms, everyone can additionally take one-hundredth of a hectare--the harvest from it must also be delivered. Thus, an auxiliary channel providing workers' restaurants and families of drillers with the necessary products was created without a single kopeck of capital expenditures. This is simple, sound and highly efficient! It seems that such experience should be popularized in every possible way. As is well known, hundreds and hundreds of tons of food waste are lost in the country every day. They could be used.

The practice of Neftyanik and of the other subsidiary farms of Tatneft' is instructive in many respects. It once again convinces us that an increase in the efficiency of agricultural production begins with a better utilization of every hectare of land. It so happens that, usually, unproductive and sometimes even simply marginal and unsuitable land of every description is allocated to subsidiary farms. It is difficult to develop such areas. They require reclamation, intensified liming and the application of large quantities of organic and mineral fertilizers. However, be that as it may, this must be done. The fertile strength of land must be restored and increased.

Not long ago the Neftyanik Sovkhoz obtained 7 to 8 quintals of spring wheat per hectare. During the 10th Five-Year Plan its yield was increased to 20.3 quintals, that is, the yield of land was increased 2.5-fold. Even during this year with its unprecedented drought large grain yields were obtained on many fields. Vegetable growers on the sovkhoz are working successfully. During the past five-year plan they increased the yield by 75 quintals and, on the average, annually harvested 228.3 quintals of vitamin output per hectare.

Efficiency Potentials

What to do so that benefactress-land might become even more generous? Previously petroleum workers did not especially rack their brains, laying various utility lines, digging trenches and placing columns everywhere. Here and there they were thicker than a forest. From the departmental point of view there is nothing terrible in this, but, as far as land is concerned, this represents total indifference. Now this is not tolerated and measures are taken to remove numerous ground supports from plots of land. There is one way out--to accurately lay underground cable lines. In this way hundreds of hectares of land, primarily irrigated, are again put into circulation.

Petroleum workers are especially concerned with the feed problem. Without irrigation the necessary quantity and quality of feed cannot be obtained. Therefore, it was decided to engage in real earnest in the establishment of irrigation systems as of this year. Winter came, but it did not stop reclamation work. Powerful equipment operates on future irrigated plots and pipes and artificial rain units are brought there. The irrigation of several fields and meadows is to begin in spring and the areas of reclaimed land are to be increased to 2,500 hectares in the very near future. According to the calculations of specialists, each of them will approximately triple productivity. Otherwise a significant increase in the livestock population and intensification of animal husbandry cannot be expected.

As a rule, subsidiary farms aim at early ripening sectors. This is quite justified, because this makes it possible to obtain maximum output during the shortest period. Neftyanik is engaged in the fattening of large-horned cattle for meat specialization. There the daily weight gains of animals exceed 700 grams. Last year the weight of every delivered head was 413 kg. On the sovkhos there is a rabbit breeding farm, which supplies top-quality meat. There an attempt is made to more fully utilize the fertility and rapid growth of small furry wild animals. We visited the buildings of the recently built broiler factory. Its flow technology of meat poultry production should significantly replenish the food stocks of the workers' supply administration of Tatneft'.

Finally, hog breeding should be discussed especially. This is the most efficient sector in the production of meat products. Fattening centers are organized in all workers' supply divisions. When work is well organized, hog breeders obtain 450 to 500 grams of weight gain per animal every day. For example, this year 7,115 hogs were delivered for fattening, which was 20 percent more than the plan. Food waste constitutes the greatest share in the ration. A total of 6,500 tons of food waste was collected in cities and settlements. Since the beginning of the year 672 tons of meat in live weight were sold.

A brand new hog fattening complex was built on the outskirts of the workers' settlement of Aznakayevo. We visited its shops with K. Khayrutdinov, chief of the local workers' supply division. The feed kitchen is equipped according to the latest technology. Next there are conveyer lines for the distribution of full-ration feed. Automated ventilation and heating units are to maintain the climate in the building. Indeed, this is modern industrial technology. Petroleum workers, creating such a production facility, one can say, put large funds, as well as their soul, into it.

"However, not everything is within our power," the people of Aznakayevo said. "It is not enough to have walls and equipment. It is even more important to form a good purebred herd. But where can we get highly productive dams? We take what they give us indiscriminately. Sometimes we get a replenishment, owing to which much feed is used to no purpose. Apparently, the problem of providing subsidiary farms with pedigree livestock must be thought out more thoroughly. This is the direct concern of agricultural bodies."

Or another problem: How to utilize food waste more efficiently? Every year it is utilized in increasing volumes, but not always sensibly. Food waste should arrive on a farm and be fed to animals in fresh form. This product is perishable especially in summer in hot weather. It is not always possible to preserve a large quantity of valuable feed.

Special technology making it possible to save food waste for current use, as well as to store it for the future, was developed a long time ago. However, this requires devices for the cleaning and grading, as well as drying, of waste. In dry form it is hardly subjected to spoilage and does not lose its nutritive value. Unfortunately, it is very difficult to find such equipment.

Secondary energy resources greatly help the subsidiary farms of industrial enterprises. There are many such resources in the petroleum industry and allied sectors. The Minnibayevskiy Gas Refining Plant imeni Leninskiy Komsomol is located near Al'met'yevsk. Naturally, Neftyanik specialists got the idea to utilize the waste heat of this production facility for the establishment of hothouses. They performed calculations, prepared plans and began to build one hothouse after another. Now hothouses occupy an area of about 26,000 square meters. A pool of vegetables--tomatoes, cucumbers and greens--is annually harvested from each of them. Even now, when there is a hard frost on the street, tomatoes appetizingly turn red and scallions, green on seedbeds under the glass roof. This year in 10 months the sovkhos sold about 430 tons of vegetables produced on glass covered ground--as much as during the entire last year.

Now, however, there is not enough heat for this "garden." A boiler room had to be built, which, of course, is not very profitable, but otherwise nothing would be obtained. True, heat leaks and steam discharges into the atmosphere at the plant did not decrease. The whole point is that heat energy is supplied to the sovkhos very irregularly--feast or famine. But it is enough to freeze plants once and no harvest can be expected. Apparently, to be on the safe side, it is necessary to check some variants. However, the plant management does not manifest special interest in rural affairs, saying that the sovkhos is another "department."

It should be noted that in Tataria's east, which is called petroleum land, secondary resources are highly substantial. A great deal of heat--2.4 million kw--is lost at the Zainskaya GRES, the most powerful in the republic. With the discharged water it heats a whole lake, which does not freeze even in a harsh winter. Fish breeding in this reservoir and the establishment of large-scale fish industry have been discussed for many years. However, time is passing and the fish catch remains meager. The Urussinskaya GRES is another source. It has a small capacity, the specific expenditure of fuel exceeds the standards and the question of closing the station has even been raised. At the same time, power engineers made the following calculations: If a hothouse facility is built nearby and secondary heat is supplied there, it will be possible to greatly increase the efficiency of the power unit and to gain a double advantage. Byproduct gas extracted from the interior of the earth together with petroleum is another resource of the petroleum industry heretofore not utilized for the production of agricultural products.

There are also other potentials. Their activation requires neither complex engineering calculations, nor large capital investments. As we see it, these unutilized capabilities are of a pronounced psychological and organizational nature. Here is a simple example. When Tataria's petroleum workers celebrated the output of the 2 billionth ton of petroleum, for some reason no one recalled the contribution of the workers of the association's agrarian shop to this victory. They were not in the presidium of the festive meeting, incentives were not provided for them and they were not thanked. This was offensive to milkers and field crop and vegetable growers. After all, they too worked for the common success.

Or the following case: B. Shaymardanov, I. Giniyatullin and A. Matyushin, combine operators on the Neftyanik Sovkhoz, told us that the farm was the last--if something was left--to receive vitamins, medication for livestock, spare parts and farm machinery from the rayon administration of agriculture and the local department of Sel'khoztekhnika. Not everything is satisfactory with special work clothing. At the same time, one argument openly or secretly decisive in such an attitude toward the subsidiary farm of an industrial enterprise is advanced: You don't work for the plan, you are not ours.

We encountered such cases not only on Neftyanik. This puts us on the alert. As already stated, many industrial enterprises, not only in the Tatneft' Association, are now establishing rural shops. Every year subsidiary farms acquire ever more visible features of a large agroindustrial complex. Of course, this brings about an urgent need to improve the mechanism of administration of these complexes.

Appropriate services of agriculture were established in some industrial ministries. In the opinion of specialists thought should be given to the establishment of an all-Union coordinating center, which could competently and efficiently solve such problems as providing subsidiary farms with everything that is necessary for their fruitful activity. Probably, it is necessary to more efficiently determine the system of administration on a territorial scale. As yet local agricultural bodies do not always find a common language with the subsidiary farms of industrial enterprises.

The well-known decree of the CPSU Central Committee and of the USSR Council of Ministers "On Subsidiary Farms of Enterprises, Organizations and Institutions" opens the way for the development of this enterprise important for the national economy. The decree sets forth the basic principles of organization and functioning of such farms and establishes an efficient procedure for providing them with land, varietal seeds, planting stock, young pedigree stock and veterinary and other services. When plans for the distribution of material and technical resources are worked out, provision is made for the allocation of tractors, combines, mineral fertilizers, farm machinery, equipment and spare parts to subsidiary farms, regardless of their departmental subordination, in accordance with the same procedure established for kolkhozes and sovkhozes.

Thus, we must see to it that this party and government directive is fulfilled strictly. A narrow departmental approach is inadmissible in the large-scale and important statewide matter of provision of food products for the population. It is not important who produces the products of fields and farms--the kolkhoz, sovkhoz or rural shop of a plant or an association. The main thing is that these products go to every Soviet family and to workers' tables.

The experience of the Tatneft' Association in the establishment of its own food base is instructive in many respects. It shows the considerable potentials existing in the localities for a fuller provision of the population with high-quality food products. The great possibilities of increasing the yield of rural shops are now evident. Their further development is one of the major concerns of Soviet bodies, ministries, departments and farm managers. It is necessary to intensify the attention to this important section of the economy and to more fully utilize all the resources for increasing the production of food products.

ORGANIZATION OF KOMI ASSR SUBSIDIARY ENTERPRISES DESCRIBED

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[Article by A. Meledin, secretary of the Komi Oblast CPSU Committee: "Agrarian Department of the Timano-Pechorskiy Complex"]

/Text/ In carrying out the tasks associated with intensifying the production of agricultural products, the party and government are attaching considerable importance to developing the subsidiary farms of industrial, transport and other enterprises, organizations and institutes. Towards this end, the CC CPSU and the USSR Council of Ministers, in December 1978, adopted a special decree entitled "Subsidiary Farms of Enterprises, Organizations and Institutes." In the following article from the Komi ASSR, information is provided on the experience accumulated in the development of subsidiary farms.

The rich natural resources of the European north are being mastered at high rates in our country. During the years of the five-year plans, for example, in the Komi ASSR, which celebrated its 60th anniversary this year, such branches of industry as coal, petroleum, gas, chemical, wood-working, cellulose-paper and others were created. At the present time, in conformity with the Basic Directions, work continues to be carried out in connection with the formation of the Timano-Pechorskiy Territorial-Production Complex, based upon the fuel-energy, ore and forestry resources found in the Komi ASSR and in the Nenetskiy AO. New cities and settlements are appearing. The people here are taking up permanent residence. The oblast party organization must solve the problem of accelerated development in keeping with the economically justified dimensions of the local production base. A most important condition for retaining personnel is that of ensuring that the population is continuously supplied with such products as whole milk, meat, dietetic eggs, potatoes and fresh vegetables.

The organization of agricultural production under our conditions is certainly a difficult and complicated undertaking: here we have in mind the development of such production in severe uninhabited regions. Nevertheless, the necessary conditions are available for the efficient management of farming and animal husbandry operations. During the brief arctic summer, the tundra and forest-tundra are covered by wild vegetation. This represents a source for obtaining cheap feed for public animal husbandry. Rich fuel-energy resources are available here for the development of hothouse farming. Moreover, the industrial associations have equipment and material resources available for organizing large-

scale and highly mechanized agricultural operations. There is only one requirement: they must be found and employed for developing the branch in a manner such that the rates of growth for producing farming and animal husbandry products not only match but even surpass the rates of growth for the republic's population, especially the municipal population.

In view of the mentioned circumstances, the party organization of the autonomous republic has chosen to follow the path of creating subsidiary farms and sovkhoses attached to industrial, transport and construction enterprises and organizations.

For example, when work commenced in connection with the development of the large Vuktyl gas concentrate deposit, the Vuktyl Sovkhoz of the Komigazprom Association was established simultaneously with the construction of the trade and the city. Within a brief period of time, a large tract of land was introduced into agricultural use and hothouses and production facilities were built. The animal husbandry farm now numbers more than 400 cows. As a result of initiative displayed by the communists, an efficient program for further improving production has been developed at the sovkhos.

The subsidiary farms and our sovkhoses serve in the manner of agrarian departments for the enterprises and associations of industry, transport and construction. Their chief task consists of strengthening and developing agricultural production in every possible way. They are carrying out their work on a planned economic accountability basis and employing the land, equipment and material and financial resources made available to them in a rational manner.

Work carried out on the subsidiary farms and sovkhoses of industrial enterprises is organized along the same lines as that for sovkhoses belonging to the USSR Ministry of Agriculture. Mechanized teams, brigades and sections were formed within the collectives, even though the production structure of the farms is dependent upon their specialization. For example, there are no permanent field crop husbandry brigades at dairy sovkhoses in the Vorkuta region. Here, for the feed procurement period, temporary brigades are created consisting of personnel made available by the enterprises and associations. Work in the production workshops, hothouses and on farms is carried out as a rule by permanent workers obtained from among local residents and the members of families not working at factories, plants, mines and construction projects.

The subsidiary farms and sovkhoses are headed by skilled leaders who possess specialized knowledge and experience in working with people. The production work is carried out mainly by a large number of accredited specialists -- agronomists, zootechnicians, engineers and economists.

Distinct from sovkhoses subordinate to the USSR Ministry of Agriculture, the work carried out by subsidiary farms and sovkhoses of industrial, transport and construction enterprises and organizations is characterized by its own particular characteristics. First of all, the products produced by them are employed mainly for local supply to the population, through the administrations and departments for workers' supply and other organizations and institutes. Thus the subsidiary farms and sovkhoses of enterprises and associations are not provided with state plans for the sale of products. However, this is not meant to imply that their activities are not planned or controlled from a central point. The tasks for the

production and sale of products are assigned to them by the enterprises and associations themselves, based upon the requirements of the local population and the opportunities for agricultural production. The financing of departmental subsidiary farms and sovkhoses is carried out through those ministries and departments to which they are subordinate.

How did it come to pass that sovkhoses became attached to our industrial, transport and construction enterprises and organizations? At one time, certain union ministries, departments and some of the larger subsidiary farms of enterprises, trusts and combines were reorganized into sovkhoses. Actually, in terms of their size and the scale of their production activity, they are not at all inferior to the sovkhoses attached to the Ministry of Agriculture. For example, on farms of the Bol'shaya Inta Sovkhoz of the Intaugol' Association there are 3,100 head of large-horned cattle, including 1,700 cows. Here there is also a reindeer breeding farm with more than 15,000 head. Last year the sovkhos produced 6,453 tons of milk and 276 tons of meat.

The reorganization of the subsidiary farms into sovkhoses made it possible to regulate the control structure for production, the setting of norms and wages. Today, in carrying out their work, they are guided by normative documents approved for sovkhoses of the Ministry of Agriculture for the Russian Federation.

Thus, a far-flung network of subsidiary farms and sovkhoses, attached to enterprises of industry, transport and construction engaged in agricultural production, is operating in the Komi ASSR on a modern level. They are following the path of production specialization and concentration, complex mechanization, the use of chemical processes and land reclamation.

This is clearly apparent in the example set by the agrarian department of the Vorkutaugol' Production Association. It includes eight sovkhoses and a dairy plant. In addition, subsidiary farms are in operation at some mines and enterprises. The association's sovkhoses are responsible for more than 34,000 hectares of agricultural land, including 4,840 hectares of arable land. These sovkhoses are presently specializing in the production of definite types of products. Thus, five farms are engaged in milk production. They are located near the city of Vorkuta. Here they breed highly productive cows. Last year, the average milk yield per cow was 3,412 kilograms. The Gornyak Sovkhoz supplies the dairy farms with pedigree young stock. Two sovkhoses are specializing in the production of feed. One of them, the Novyy Bor Sovkhoz, is located along the lower reaches of the Pechora River where it has rich natural feed lands at its disposal. Pressed hay is shipped from here to the Vorkuta sovkhoses via the Pechora River and its tributaries. Here, at the Novyy Bor Sovkhoz, the raising of pedigree young long-horned cattle stock has been organized.

The Teplichnyy Sovkhoz, which belongs to the association, plays an important role in supplying the miners and their families with fresh vegetables. At the present time, there are 30,000 square meters of hothouse space and a large hotbed area here. The farm grows mainly cucumbers, tomatoes and green onions. The heat from an electric power station is employed for heating the hothouses. The sovkhos is located within the Arctic Circle. Winter lasts for 9-10 months here and frosts often occur during the summer months. The Vorkuta vegetable growers obtain high yields despite such severe conditions: 32-33 kilograms of cucumbers from each square meter of hothouse space.

The oblast CPSU committee is carrying out purposeful work aimed at improving the party management over agriculture. The decree of the CC CPSU and the USSR Council of Ministers entitled "Subsidiary Farms of Enterprises, Organizations and Institutes," adopted in December 1978, is considered to be of the utmost importance for our work and for the activities of the entire party organization. This document was discussed during open party meetings at all enterprises, organizations and institutes and by the boards of the republic's ministries and departments. With the participation of a large group of specialists, the collectives prepared measures for further developing the subsidiary farms.

The oblast CPSU committee and the Council of Ministers of the Komi ASSR thoroughly summarized the plans and measures of the rayons, republic ministries and departments and adopted an appropriate decree. It defined for the next few years the production volumes for potatoes, vegetables and animal husbandry products. Measures were also called for aimed at strengthening the production and feed bases and creating new subsidiary farms and sovkhozes attached to enterprises. Constant control is being exercised over the carrying out of this decree. Reports by the leaders of republic ministries, associations, enterprises and organizations, on implementation of the measures outlined, are listened to with interest on a regular basis during meetings of the secretariat of the oblast CPSU committee.

It was not too long ago that the decree of the CC CPSU and the USSR Council of Ministers concerning the development of subsidiary farms was adopted. However, changes for the better are noticeable in the development of farming and animal husbandry. In 1980, meat production on the subsidiary farms increased by 37 percent above the figure for 1978, eggs -- by 8, potatoes -- by 33 and vegetables -- by 17 percent. Noticeable increases took place on the farms in the number of large-horned cattle, swine and poultry. Moreover, the subsidiary farms sold considerable quantities of young animals and poultry to the population for subsequent raising and fattening.

Success was promoted by the great amount of assistance provided by the state. During the years of the Tenth Five-Year Plan, more than 40 million rubles worth of capital investments were made available for expanding the logistical base of the subsidiary farms. This was almost one and a half times more than the amount made available during the Ninth Five-Year Plan. Facilities were built for 5,500 swine and 2,500 head of large-horned cattle. Six new subsidiary farms for the production of milk and the fattening of swine were created within the Komlesprom Association alone. A great amount of construction work is being carried out at a subsidiary farm of the Syktyvkar Timber Industry Complex. Here the plans call for the erection of a complex for 15,000 square meters of hothouse space and a pigsty for 1,000 swine. At a trust for dining halls and restaurants, a sovkhoz has been formed based upon a subsidiary farm for specializing in the fattening of swine using food scraps.

We attach paramount importance to the task of implementing economically skilled management for the subsidiary farms and sovkhozes of enterprises and organizations. Earlier they were subordinate to the administrations of workers' supply. Analysis revealed that this was not in keeping with the increasing tasks. The administrations of workers' supply did not devote sufficient attention to strengthening the logistical and feed bases. The situation had to be corrected. A trust of sovkhozes was created attached to the large Vorkutaugol' Association.

It was provided with experienced specialist-communists. The trust is now directing the agricultural enterprises in a more skilled and efficient manner and it is producing better solutions for their future development.

In accordance with a decision handed down by the oblast CPSU committee, a party committee was created within the trust and on the subsidiary farms and sovkhoses of enterprises -- departmental party organizations with the rights of the former. In all, the trust numbers 165 communists. The majority of them work directly in production -- machine operators, animal husbandrymen, operators, builders. And the party committee of the trust and the party organizations of sovkhoses and subsidiary farms are maintaining close contacts with the party organizations of mines and construction organizations. At the same time, the party workers and the leaders of industrial enterprises visit the sovkhoses on a regular basis, where they jointly solve the tasks confronting the rural labor collectives. The trust's party committee raises questions for discussion that are considered to be very important for a majority of the organizations. Reports by economic leaders and specialists are listened to with great interest during meetings of the party committee. The creation of the party committee has promoted the activation of the activities of the party organizations of subsidiary farms and sovkhoses. This has enabled the party committee of the Vorkutaugol' Trust of sovkhoses, jointly with the economic management, to prepare specific measures for the development of the sovkhoses and subsidiary farms during the Eleventh Five-Year Plan. The plans call for an increase in the number of livestock and poultry. A program has also been outlined for capital construction and for strengthening the feed base for public animal husbandry.

A noticeable improvement has taken place in the level of party management of agricultural production on the part of the rayon and municipal party committees. In the environs of the city of Ukhta, for example, large agricultural enterprises have been formed for carrying out production operations on an industrial basis. Here there are three large sovkhoses specializing in the production of milk, potatoes and vegetables and also a poultry factory. A special machine-land reclamation station has also been created for land development and improvement purposes.

The Ukhta Sovkhoz, which is celebrating its 50th anniversary this year, serves as a good example of a city's agricultural enterprise. The farm came into being as part of the Komineft' Association. It commenced operations on a small scale -- with several hectares of land on which potatoes, cabbage and vegetables were grown. Today it is a large-scale highly mechanized sovkhos. It is responsible for more than 4,000 hectares of agricultural land. On its farms there are 1900 head of large-horned cattle, including more than 1,000 cows. There are 47,000 square meters of hothouse space. A distinctive feature of the work performed by the collective -- a high culture of farming and animal husbandry. Here they are obtaining an average of 3,880 kilograms of milk per cow. The animals are adequately supplied with coarse and succulent feed by means of internal production.

The party organization and the board of the sovkhos are displaying a considerable amount of concern for improving the living and working conditions of the workers and specialists. A large amount of capital construction is being carried out here. During the past few years, 170 well arranged apartments and clubs for 200 members have been built. Gas lines have been installed in all of the settlements.

The party organization, which is the leading element of the collective, includes 118 communists in its ranks. Departmental party organizations have been created in all of the sections and in the hothouse combine. There is much of an instructive nature in their work. Vital questions are raised for discussion by the communists. It has become a rule to inform the communists during each meeting regarding the fulfillment of decrees adopted earlier, critical comments and recommendations. The members of the party committee and the communists examine the economics of production in a very thorough manner. As a result, the collective of the Ukhta Sovkhoz fulfilled its task for the Tenth Five-Year Plan ahead of schedule and produced 2.78 million rubles worth of additional products.

The Ukhta Municipal Party Committee was largely responsible for the success achieved in agricultural development. Based upon the initiative which it displayed, an effective socialist competition is being held among the agricultural enterprises, the results of which are summarized on a regular basis. Gatherings and conferences for farming and animal husbandry experts are held on a regular basis. The municipal party organization carries out planned and consistent work aimed at raising agricultural production. For the Eleventh Five-Year Plan, the industrial enterprises, associations and also organizations and institutes in Ukhta prepared measures directed towards the further development of the subsidiary farms. The measures are very specific in nature. The tasks for output production are economically sound.

The oblast CPSU committee is employing a differentiated approach for the problems concerned with the development and placement of agricultural enterprises and it is taking into account the work and characteristics of the individual branches of industry. Agricultural zones are forming around the industrial centers. The timber industry is still another matter. From a territorial standpoint, it is dispersed and distributed, as a rule, in regions marked by poor road conditions. Thus it is necessary in forest settlements and remote regions to create small animal husbandry farms for the purpose of supplying the timber procurement specialists and their families with whole milk and fresh meat.

The 26th CPSU Congress assigned great tasks associated with the formation of a territorial-production complex. New industrial enterprises and small petroleum and gas industries are making an appearance in the republic. Hence new labor collectives, settlements and cities are also making an appearance. This requires accelerated development for agriculture throughout the republic. Thus the plans call for a considerable increase in production at sovkhozes belonging to the Ministry of Agriculture for the Komi ASSR. These enterprises will be developed in accordance with the program outlined in the decree of the CC CPSU and the USSR Council of Ministers concerning the nonchernozem zone. Measures have been developed for further improving the subsidiary farms. They have been approved and adopted by the oblast CPSU committee and the Council of Ministers for the Komi ASSR. Prior to the end of the five-year plan, the subsidiary farms will increase their milk production by 38 percent, meat -- by a factor of 2.5, eggs -- by 80 percent, potatoes -- by 70 and vegetables -- by 90 percent. Over the five-year period the number of swine will increase by a factor of 3.5 and cows -- by 29 percent.

Specific methods have been defined for achieving the mentioned goals. During the years of the Eleventh Five-Year Plan, the production base of the subsidiary farms will be strengthened. The plans call for approximately 100 million rubles of

capital investments to be utilized for this purpose. The Komgazprom, Komineft', Ukhtatransgaz, Komityazhstroy and Ukhtaneftegazgeologiya associations and a number of other large enterprises are making plans to create new subsidiary farms and sovkhozes. They have been allocated land tracts from the state reserve and the forestry fund. The erection of hothouse combines attached to compressor stations of the Siyaniye Severa gas pipeline has commenced.

In discussing the positive work experience of subsidiary farms, party organizations and committees, we must not overlook certain failures in this important work. In analyzing their activities in light of the requirements handed down during the 26th CPSU Congress, the oblast party committee uncovered substantial shortcomings. Some industrial associations and enterprises failed to undertake the measures required for increasing the production of agricultural products. Individual leaders, during the course of creating subsidiary farms, did not devote proper attention to developing their feed base. Instead, they expected to obtain forage from the state resources. And certainly, the paramount task remaining to be solved by the labor collectives and party organizations of subsidiary farms and sovkhozes is that of decisively raising the efficiency of farming and animal husbandry. Here we have in mind the need for achieving dynamic development for agricultural production based upon maximum intensification, improved labor productivity and more extensive development of the socialist competition. The successful solving of these tasks is greatly dependent upon making proper use of the land and labor, material and financial resources. Experience testifies to the fact that the agrarian departments of industrial associations and enterprises are capable not only of increasing output production substantially, but also of lowering the production costs and raising the profitability of branches in the agricultural complex.

The party organization is devoting a great amount of effort towards eliminating existing shortcomings and raising the fighting efficiency and initiative of the primary party organizations and the personal responsibility of the personnel for the fulfillment of all plans and measures and for the development of rural subsidiary farms based upon further production intensification.

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TILLING AND CROPPING TECHNOLOGY

INNOVATIONS, IMPLEMENTATIONS IN AGROTECHNOLOGY IN SOUTHEASTERN RSFSR DISCUSSED

Moscow IZVESTIYA in Russian 30 Sep 81 p 2

[Article by M. Popugayev, director of the Scientific Research Institute of Agriculture for the Southeast, Saratov: "A System of Farming and the Harvest"]

[Text] In all of the natural-economic zones, krais, oblasts and autonomous republics of the Russian Federation, work is presently continuing or nearing completion on the development of scientifically sound farming systems, as called for in the decisions handed down during the 26th party congress.

Aware of the great importance being attached to these systems for intensifying farming and raising the efficiency of all agricultural production, the Presidium of the Council of Ministers for the RSFSR, on 28 September, examined the question "On the Work of the Scientific Research Institute of Agriculture for the Southeast With Regard To the Development and Introduction Into Production Operations of Scientifically Sound Farming Systems."

What experience has been accumulated in the development and mastering of these systems? What difficulties and shortcomings have surfaced here? What methods can be employed for overcoming them? This article is dedicated to these and other vital problems associated with the introduction of scientifically sound farming systems.

The Volga region, as is well known, is the country's largest grain area. During the best years in terms of weather conditions, such as 1978, the gross yield of grain in our zone reached 36.9 million tons and the amount procured by the state -- 18.4 million tons. In other words, almost one out of every three quintals of grain procured during this year at kolkhozes and sovkhoses in the Russian Federation was procured in the Volga region.

However there were also years, such as 1975, when grain production for the zone on the whole fell to 11.6 million tons and grain procurements -- only 2.3 million tons. Great fluctuations in cropping power and gross yields for the grain crops occur in all oblasts and autonomous republics in the zone. In Saratovskaya Oblast, for example, the difference between the highest and lowest cropping power amounted to

approximately 17 quintals per hectare and the gross yields fluctuated from 1.6 to 8.4 million tons, or by more than a factor of five.

Such great fluctuations in cropping power once again underscore the unstable nature of farming carried out in our zone. Many farm leaders and specialists believe that such an abnormal situation is caused only by drought conditions. But by no means are droughts considered to be extraordinary phenomena in the Volga region. They are extremely natural, albeit undesirable, regularities that occur roughly 2-3 times during every 5 years in our area.

Other factors are involved: how to counter the elements? How to achieve a situation wherein grain will always be available even during extreme conditions?

Science and practical experience provide answers for these questions. In each rayon and particularly in each oblast and autonomous republic in the Volga region, just as in other regions, there are farms which obtain high and stable yields for their grain and other crops during all types of weather conditions. For the most part, these are farms where use is being made of a scientifically sound system of farming.

This is a system which calls for the introduction into production operations of an interrelated complex of agrotechnical, economic and organizational measures, aimed at achieving expanded reproduction of soil fertility, steady growth and stability in the cropping power of agricultural crops and improvements in the quality of output, with minimal expenditures of labor and resources per unit of this output.

Fine yields are being obtained, even during poor weather, in those areas where a scientifically sound system of farming is being followed, where an entire complex of measures is being implemented and where local conditions are being taken into account. Here are several convincing facts.

Everyone is aware of the difficulties being encountered in many regions of the country during this current agricultural year. In our Volga region and particularly in Saratovskaya Oblast, where very hot weather commenced during the second 10-day period in May, the workers had to endure such heat, with only minor interruptions, right up until the end of August. In June and July, for a period of 38 days, the air temperature remained higher than 30 degrees. The maximum temperatures -- 37-39 degrees. And there was no rainfall.

It is obvious that such severe weather-climatic conditions exert an adverse effect on a crop. But not in all areas.

For example, let us take the Yeruslanskiy Sovkhoz. This is a typical steppe farm, located in the very center of the Zavolzh'ye region, an area that suffers perpetually from drought conditions. Nevertheless, a fine yield was obtained here this year and also for a number of years stretching into the past. An average of 21.3 quintals of grain per hectare was obtained from the entire winter crop area (1,959 hectares), or greater by a factor of two than the average indicator for the oblast.

Nor was this a random happening. All of the winter crops here were sown following clean fallow. Importance was attached to a number of factors: one half of the winter crop area at the sovkhos was cultivated using sweeps, first class seed was

planted in the ground, windbreak strips consisting of sunflower plants were sown throughout the entire area and in the autumn each hectare of winter crop was provided with approximately 60 kilograms of phosphorus fertilizers and early in the spring -- 45-50 kilograms of ammonium nitrate. Such were all of the chief "secrets" of the Yeruslanskiy Sovkhoz.

In Fedorovskiy Rayon, where the Yeruslanskiy Sovkhoz is located, for the fourth year in a row and jointly with the scientists from our institute, the grain growers are introducing a scientifically sound grain-fallow system of farming, in combination with soil-protective cultivation of the land. Active work is being carried out in connection with improving the structure of the areas under crops and the crop rotation plans, enlarging the fields and employing an advanced technology for the cultivation of agricultural crops. The number of crop rotation plans has been reduced here by almost twofold, with 5-6 field grain-fallow crop rotation plans being introduced in place of grain-fallow-cultivated and grain-cultivated plans. Of significance is the fact that during the years in which the new system was being mastered, the clean fallow areas in the rayon increased by a factor of 1.8 and presently constitute 15-15.6 percent of the arable land. It is obvious that the grain fields have decreased somewhat, but in return a considerable increase has taken place in the cropping power of the fields and in the stability of the entire grain economy. As a result, the average annual production of grain increased by a factor of 1.3 throughout the rayon as a whole.

Based upon the experience of this rayon and other leading farms in Saratovskaya Oblast and upon scientific conclusions and recommendations, the scientists of our institute, jointly with other scientific research institutes and the oblast's agricultural administration, developed and received approval from VASKhNIL /All-Union Academy of Agricultural Sciences imeni V.I. Lenin/ for a scientifically sound system of farming for the oblast for the 1981-1985 period.

This system includes: scientifically sound farming specialization with a rational structure for the area under crops and the mastering of a system of crop rotation plans; a system for the principal and pre-sowing tilling of the soil and the tending of the crops; strict observance of the agrotechnical schedules and the quality of all field work; campaign against water and wind erosion; a system for the use of fertilizers and for protecting plants against pests, diseases and weeds; extensive use of the best regionalized high quality seed; measures for ensuring maximum accumulation and retention of moisture in the soil; maximum development of regular and catchwork irrigation; field-protective forestation.

Since Saratovskaya Oblast is distinguished by extremely diverse soil-climatic and economic conditions, the system of farming was developed for seven micro-zones in the oblast.

What methods must be employed for solving the most important problem of raising the cropping power of grain crops and the stability of grain yields during all years, regardless of the caprices of nature? First of all, the winter crops must be increased in the structure of the areas under crops. Science and leading experience reveal that winter crops are distinguished by a higher level of cropping power than spring grain crops. And this is particularly noticeable during dry years. This year the winter crop yields on leading farms, following clean fallow, amounted to 20-24 quintals per hectare and spring wheat -- 3-4 times less. The advantages of

bare fallow as a predecessor arrangement for winter crops are always apparent and during dry years -- to a greater degree.

It is quite clear: the winter crop sowings must be increased. According to our computations, their area within the oblast must be increased by no less than a factor of 1.7, or 1.3 million hectares. Certainly, the farmers are aware of the advantages to be realized from an expansion of the winter crop fields. But there is still not enough clean fallow for this throughout the oblast. The opinion still persists that it is best to sow as much land as possible every year. The result: a profit is realized during good and rainy years, but during poor dry years, such as this present one, the harvest is somewhat less. And on the whole, as everyone knows, a loss is sustained. No doubt two-times Hero of Socialist Labor T.S. Mal'tsev was correct when he stated in his article entitled "In Order To Obtain a Stable Harvest" (IZVESTIYA No. 219) that it is wrong to live just for today and that one must be able to keep an eye on tomorrow.

We believe that the oblast's clean fallow areas, which guarantee yields during any and all conditions, must be increased twofold to 930,000 hectares, or 14.5 percent of the arable land. Certainly, this is an average for the branch since, as already mentioned, we have extremely diverse microzones: in the west -- 400-420 millimeters of precipitation annually and in the southeast -- only 230-260 millimeters. Thus in the Zavolzh'ye steppe regions the winter crops should be sown only following clean fallow. Moreover, in the southeastern rayons the winter crop fields should be occupied mainly by rye, which surpasses winter wheat here in terms of its cropping power, winter hardiness and drought resistance.

An increase in the areas sown in winter crops following clean fallow is solving another important task: one of the best predecessor arrangements for spring wheat and sugar beets is being introduced into the crop rotation plan in the form of fallow winter crops. This is making it possible to raise the cropping power of grain crops by 2-4 quintals and beets -- by 25-30 quintals per hectare and at the same time it is raising the quality of the output. Thus, spring wheat sown in a group with clean fallow will contain an average of 3.7 percent gluten and winter wheat -- 7.8 percent more gluten than if the wheat was grown in a group without clean fallow.

Certainly, we must not overlook the quality of the fallow, it should be plowed well in the autumn, adequate quantities of organic and mineral fertilizers must be applied, windbreak strips must be sown and these areas must be maintained constantly in a clean condition. If these measures are not carried out, as is sometimes the case, the farm may have fallow, but it will be overgrown with weeds and thus will not produce the desired results. In general, the schedules and quality for carrying out all agricultural operations without exception warrant special mention. Thus, according to data provided by our institute, the cropping power of spring wheat on a field cultivated on the first day of soil ripening amounted to 22.9 quintals per hectare, 7 days later -- 21.3, 14 days later -- only 17.8. A deviation in the schedule for sowing the winter crops, from the optimum period, lowered the yield by 4-5.7 quintals per hectare.

There is still one more important circumstance. In Saratovskaya Oblast, the sweep cultivation of a field aids greatly in accumulating moisture in the soil. Moreover,

it provides excellent protection for the steppe lands against wind erosion. Experience has shown that all of these factors serve to raise the cropping power of grain crops by one and a half to two quintals per hectare and during dry years -- by 3-4 quintals per hectare. This is why, when introducing scientifically sound farming systems into operational practice, a need exists for employing soil-protective cultivation on a more extensive scale. Thus, there are presently one million such hectares in Saratovskaya Oblast and this area must be increased twofold during the Eleventh Five-Year Plan. Unfortunately, there are many difficulties here. Industry is supplying agriculture with very little soil-protective equipment. Yes and the capabilities of this equipment are weak.

One extremely serious problem is that of fertilizer. According to data supplied by our institute, the average withdrawal of nutrients together with a crop, over the past 4 years in Saratovskaya Oblast, was: nitrogen -- 39, phosphorus -- 15, potassium -- 32 kilograms. And these nutrients are not being returned to the land in full volume. At the present time, the oblast's farms are annually applying an average of slightly more than 1 ton of farmyard manure and 40-50 kilograms of standard mineral fertilizer to a hectare of non-irrigated land. And this is very little. Each year, the amounts applied per hectare should be at least 2-3 times greater. This would make it possible to maintain a nutrient balance. However, each hectare requires 4-5 tons of farmyard manure annually in order for the humus to be replaced fully. This is a complicated task and yet it must be carried out. Here we have in mind the need for increasing the procurements of organic materials, ensuring its proper storage and conducting an intensive search for new and additional sources for supplementing the organic substances in the soil. It is here that the scientists can and must make their presence known. It must be recognized that scientific studies in the Volga region on the problem of soil fertility are still not in keeping with the modern requirements for developing agricultural production.

And which grain crop varieties should be used? Certainly, it is gratifying to note that the country is obtaining more than 5 million additional tons of grain owing to the use of our varieties. But another fact bears mentioning: earlier the institute did not provide its own high yield varieties of barley and winter wheat. Work concerned with the breeding of alfalfa and soybeans is only now unfolding. One reason for this -- insufficient completeness in the carrying out of studies. Our experimental-production farms have still not become true advocates for the introduction of scientific works into operations. These and other shortcomings were pointed out quite fairly by the Presidium of the RSFSR Council of Ministers, during the course of discussing the work of our institute in developing and introducing scientifically sound farming systems into operations.

Our collective is doing everything possible to ensure that these shortcomings are corrected in the near future. In the process, special emphasis being placed upon the introduction of the scientifically sound system of farming into operations.

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